

An industry report prepared under the Single Vision Grains Australia process

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# > > > Principles for process management of grain within the Australian supply chain:

A guide for industry in an  
environment where GM and non-GM  
grain is marketed



**PRINCIPLES FOR  
PROCESS MANAGEMENT OF GRAIN  
WITHIN THE  
AUSTRALIAN SUPPLY CHAIN**

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## 1. Purpose and Aim of this Document

The purpose of this document is to describe the Principles that the Australian grains industry will encompass to ensure all grain and grain products marketed meet customer requirements. These Principles are developed specifically to assist the industry to market the crop following the introduction of GM grains in a manner that maintains choice for supply chain stakeholders and customers. The Principles may also be applicable to the marketing of all crops prior to GM grain grown commercially in Australia.

This document applies to all participant activities in the supply chain from gene technology development through to the end consumer, and applies to planting seed and grain used in the Australian domestic market and to grain exported.

The objective of the document is to provide an outline of the Principles required to be managed to meet a specific outcome, that is, to meet domestic or export customer requirements. All sectors of the supply chain have their own proprietary ways of managing the planting seed, grain and grain products they handle. This document does not detail who should perform each activity and how each participant must conduct that activity. Individuals should review the Principles and determine within their own company the operational processes required to demonstrate the outcome that customer requirements can be met.

By following these Principles and implementing appropriate practices, existing products and markets will not be disrupted unintentionally or that such effects can be managed with minimal impact following the introduction of GM grains. Thus the grains industry, including related sectors such as Government, researchers and consumers will gain confidence in existing processes to enable the introduction and marketing of GM grains without adverse effects on the marketing of grain and grain products from conventional and specialty crops.

Detailed in this document are the standards, quality assurance practices, other processes and testing regimes which participants in the supply chain may use to assist in the task of supplying customers with grain and grain products. A combination of these quality assurance systems, storage and transport practices and sampling and testing regimes also assists the commercial marketing of grain in compliance with Australian regulatory requirements at State, Territory and Federal levels and to comply with industry standards

It is important to note that this document details Principles relating only to technical and market access issues associated with GM crops that are necessary to market planting seed, grain and grain products. It does not cover public health and safety and environmental issues of GM crops as these are covered by existing Australian regulation. Nor does it cover how market and consumer choice influence the supply chain. However, it documents the process leading to consumers' ability to choose whatever product they desire with confidence that the entire supply chain implements the necessary procedures to handle and market that commodity.

The grains industry is committed to industry management via a transparent process of maintaining accurate auditable records that are underpinned by rigorous QA screening processes and stringent sampling and testing regimes.

Note that, at the time of writing, there are no commercially produced GM grain crops grown in Australia. While the document focuses on Principles relating to all grains, a discrete section relating to canola is included due to the approval by the Office of the Gene Technology Regulator to commercially grow this crop in Australia. Anticipating the introduction of other GM crops into the industry, this document describes the Principles that apply to all types of grain crop. Specific elements to be managed may need to be included for other GM crops as required.

## 2. Executive Summary

### 2.1 Principles

The Australian grains industry comprises a range of participants from gene technology research, plant breeding and seed companies who develop and produce varieties required by growers, growers who grow and manage the crops and a range of logistic and marketing organisations involved in the provision of the harvested crop to the end customer. All operate with a main purpose in mind: to produce a quality product at an economic price that meets the spectrum of customer requirements.

Different products are generated depending on the end customer. Products may come, for example, from conventional, non-GM or specialty crop sources and, in future, from GM grains. Industry has developed processes and protocols outlined in this document to ensure each product can be supplied as per customer needs without adversely affecting other industry participants.

The processes employed vary depending on the outcome required. Each industry participant manages their own operations based on the needs of their customer and their own internal procedures and systems. The Principles listed in this document are outcome based, reflecting a range of procedures and processes that are applied to meet the objectives of each supply chain participant.

The processes to be managed are applicable to all planting seed, grains and grain products and are critical in enabling a GM crop to be introduced and managed within the Australian grains industry. Supply chains therefore include all elements of pre-farm seed production, on-farm grain production, storage and transport infrastructures, either existing or new, that:

- enable GM planting seed and grain to co-exist, or
- use a semi-integrated system, or
- require separate supply chains and infrastructure

Elements of quality assurance (QA) apply along the entire supply chain including verification (e.g. sampling and testing) when needed to verify the integrity of the process by which planting seed and grain presented for sale accords with customer specifications. The verification process will be carried out to the extent the market requires (i.e. sampling and testing, document records, visual appraisal). In accordance with QA requirements, compliance with the systems will be capable of being verified by appropriate document review and reference to standards held by relevant sectors of the industry.

These Principles make use of existing standards and Codes of Practice applicable to GM, non-GM and specialty planting seed and grains. For GM this includes technology agreements, technology stewardship practices and commercial grain contracts.

Based on customer product requirements, management systems such as bulk handling (i.e. non-differentiated), segregation, identity preservation and traceability may be

applied to manage the process of planting seed and grain movement through the supply chain.

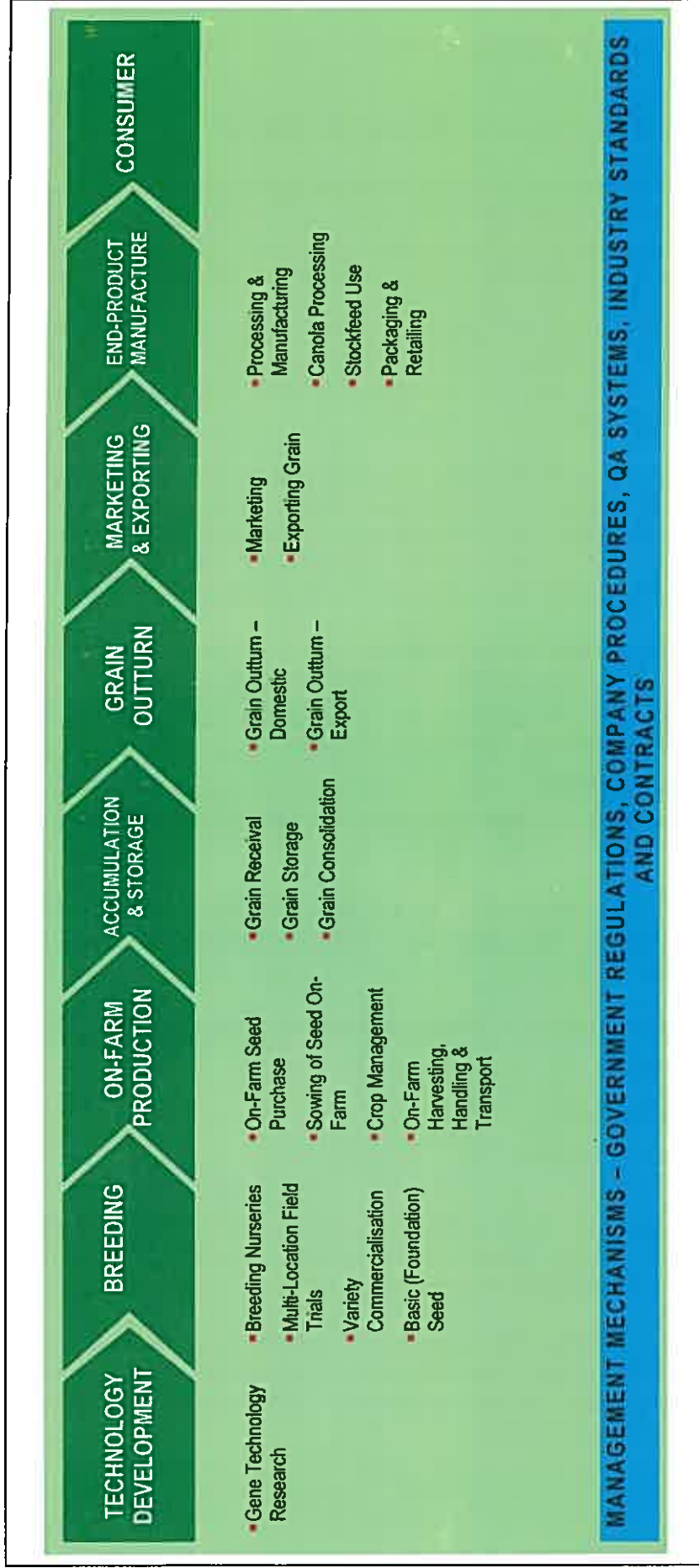
The management elements previously developed by the former Gene Technology Grains Committee have been updated.

The term 'no testing required' in this document refers to the absence of a mandatory need to test for the presence of GM to ensure compliance to QA standards. Testing will occur as required by the customer or regulator or as determined by the supply chain participant to ensure compliance with specifications or tolerance levels.

Diagram 1 below outlines the processes to be managed within the Australian grain supply chain. There are many variations depending on the individual circumstances and market. The over-arching premise is that industry Standards and Protocols and Government regulations apply at many stages in the supply chain, enabling the handling of grains, from whatever source, to be effectively controlled and economically marketed.



**Diagram 1: Processes to be managed within the Australian Supply Chain**



## 2.2 Supply Chain Product Verification & Integrity

Increasingly stakeholders in the supply chain are having to invest in the establishment and implementation of elaborate supply chain management schemes in order to ensure that the customer is not only informed about the content of the product being delivered, but also the process by which the products integrity is maintained along the supply chain.

The level of complexity and integration of the supply chain management processes implemented can vary based on the justification that the market deems necessary for access to the market (i.e., non-discriminating bulk handling, segregation, identity preservation and traceability).

As stated in the section on Principles, this document provides the industry with tools to meet the desired outcome of the individual supply chain participants. A stakeholder operating along the supply chain will approach a commercial supplier of services seeking fulfilment of their needs. Some suppliers will choose to enter the market and meet the needs of the customer and others may not choose to provide services.

How the individual supply chain participant choose to manage the process of meeting their customer requirements depends on a range of factors, including:

- The nature of the customer product required
- Existing regulations
- The requirements of “in-house” QA systems and procedures

The individual supply chain participant will thus apply their own propriety systems and those currently applied by others in the industry to manage those outcomes. The tools available include:

- Appropriate sampling and testing regimes, including visual inspection
- QA systems
- Product Standards
- Documentation audits

Different organisations will have differing levels of adoption of these tools based on the factors mentioned above. This document outlines a checklist of the processes to be managed and provides a range of tools suitable for use.

The following summarises the relevance of specific terms used in the supply chain relating to their role in assisting participants to manage and maintain product integrity based on predetermined customer requirements. These terms relate to conventional crops, non-GM, GM and specialty crops.

### 2.2.1 Identity Preservation

Identity Preservation can be defined as a process by which a crop is grown, handled, delivered and processed under controlled conditions to assure the customer that the crop has maintained its unique identity from the germplasm to end use.

Identity-preserved marketing focuses on preserving a specific trait typically found in single or multiple varieties through the supply chain with the intent of increasing the value of the product at the point of sale.

Traditionally, Identity Preservation systems catered for unique segregations with readily defined quality parameters such as pure varietal segregations for malt barley. Another context has emerged that focuses on providing the customer with a higher valued product that commands a premium. The product and its associated Identity Preservation process offer higher returns to all elements in the supply chain associated with its production.

### 2.2.2 Segregation

Segregation refers to a process by which crops are kept separate to avoid commingling during planting, harvest, delivery, handling, storage and transport to the end-user. Segregation may be utilised when there is a food safety concern with admixture of other similar products or where the product is required to meet specifications of the end-user.

The terms Identity Preservation and Segregation are often used interchangeably.

### 2.2.3 Traceability

Traceability is defined by the International Standards Organisation (ISO) as ‘the ability to trace the history, application or location of an entity by means of recorded information’. Traceability systems capture and integrate data collected along the supply chain so that it is possible to trace the product back through the supply chain to the point of origin. This ability to “trace back” the product from where it was sourced has many benefits including:

- identification of issues with processes in the supply chain
- capability for remedial action, including product recall
- enforcement of labelling claims
- assist in the development and enhancement of QA procedures

Traceability in itself is not capable of ensuring product safety or integrity of the product.

Frequently the above terms are used interchangeably in the supply chain literature. The misinterpretation and misuse of these terms is creating confusion. Table 1 provides a comparison of the key features and elements of these processes.

**Table 1: Comparing identity preservation, segregation and traceability supply chain management schemes**

<b>Supply Chain Management Scheme</b>	<b>Identity Preservation</b>	<b>Segregation</b>	<b>Traceability</b>
<b>1 : Overall Management</b>			
<b>Objective</b>	Revenue Management	Product Safety	Liability Management
<b>Status</b>	Voluntary	Mandatory	Voluntary or Mandatory
<b>Lead Stakeholder</b>	Private company	Regulator	Commodity group, standards organisation or regulator
<b>Information Flow</b>	One or two way	One – way	Two – way
<b>Supply Chain Focus</b>	Down stream	Down stream	Upstream
<b>Testing/Auditing</b>	2 <sup>nd</sup> party/brand	1st party/regulator	3rd party/ standards organisation
<b>2: Production Stage Features</b>			
<b>Production Arrangements</b>	Formal production contracts	Regulation and contracts	Membership in quality standards
<b>Production Controls</b>	In-season agronomic rules vary with product	Formal buffer zones: post production land use controls	Process standards adopted and record keeping
<b>3: Processing Stage Features</b>			
<b>Enforcement</b>	Private	Public	Collective
<b>Quality criteria based on</b>	Product standards	Regs or HACCP	Processes (e.g. ISO)
<b>Tolerance levels</b>	Variable	Set in law	Performance based
<b>Testing/auditing</b>	2 <sup>nd</sup> party	1st party	3 <sup>rd</sup> party
<b>4: Retail Stage Features</b>			
<b>Provides access to</b>	Branded product market	Markets	Product categories
<b>Information provided to</b>	Consumer	Regulators	Regulator, retailer or processor
<b>Penalties for failure in product management</b>	Consumer fraud charges: lost brand value	Criminal prosecution: mandated product recalls	Consumer fraud charges: exclusion from product category
<b>Price premium</b>	Yes	None	None
<b>Labelling</b>	Private brands	None	Quality standards

Source: Phillips and Smyth (2004)

### 2.3 Summary List of Outcomes of Process Management

Table 2 summarises the outcome resulting from all processes that are required to be managed along the supply chain, how industry may manage them and a reference for industry for further guidance and information.

Reference sources are detailed in Appendices 1 to 6.

**Table 2 – Summary of Outcomes of Process Management**

Outcome of Process	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<b>3.1.1 Gene Technology Research</b>		
<i>Access to suitable traits such as abiotic and biotic stress, grain quality and processing traits</i>	n/a	Table 1.1
<i>Traits present in the donor seed germplasm are either OGTR approved or OGTR approved research events</i>	19	Table 1.1
<i>Traits are identified and labelled</i>	5	Table 1.1
<i>Imported GM material is accompanied by a declaration</i>	3	Table 1.1
<i>The OGTR and AQIS signoff on imported GM material</i>	3	Table 1.1
<i>AQIS provide an import permit for seed classified as a non-restricted species</i>	3	Table 1.1
<i>Research on GM material is conducted under OGTR licence conditions to minimise the potential for the unintended presence of the GM material in non GM breeding lines</i>	3	Table 1.1
<i>Breeding organisations have internal protocols for managing research events</i>	3	Table 1.1
<i>Research companies have documented procedures</i>	9, 13, 15	Table 1.1
<b>3.2.1 Breeding Nurseries</b>		
<i>Non-GM breeding lines grown are identified and labelled</i>	1, 5, 9, 15	Table 1.2
<i>OGTR approved or OGTR approved research events in GM breeding lines are identified and labelled</i>	1, 5, 9, 15	Table 1.2
<i>A test method for detection of the GM trait is available</i>	3	Table 1.2
<i>GM nurseries operate under OGTR licences and supervision</i>	3, 19	Table 1.1
<i>Breeding companies have documented</i>	5	Table 1.2, 1.3

Outcome of Process	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>procedures to maintain integrity of product</i>		
<b>3.2.2 Multi-Location Field Trials</b>		
<i>Varieties grown are identified and labelled</i>	1, 5, 9, 15	Table 1.2, 1.3
<i>GM material is associated with a test method for detection of the GM event</i>	3	Table 1.2, 1.3
<i>Breeding companies have documented procedures to maintain integrity of product grown in these trials</i>	5	Table 1.2, 1.3
<i>Seed is grown under an appropriate Certification Scheme or Management System such as the ASF Best Practice Guidelines for Sowing Seed for canola</i>	1, 3, 9, 15	Table 1.2, 1.3
<b>3.2.3 Variety Commercialisation</b>		
<i>Varieties have passed all agronomic and quality attribute tests</i>	3	Table 1.2, 1.3
<i>Varieties are labelled</i>	1, 5, 9, 15	Table 1.3, 1.5
<i>OGTR approved events present for GM seed</i>	19	Table 1.1, 1.3, 1.5
<i>Inventory control of all stocks of seed</i>	5	Table 1.2, 1.3, 1.5
<i>Market acceptance in key importing and exporting countries</i>	3, 14, 21	Table 2.2, 3.2, 3.4
<b>3.2.4 Basic (Foundation) Seed</b>		
<i>Seed grown under an appropriate Certification Scheme or Management System such as the ASF Best Practice Guidelines for Sowing Seed for canola or the OECD seed certification scheme</i>	1, 3, 5, 9, 15	Table 1.2, 1.3
<i>Seed is grown in sufficient quantities for commercial sale</i>	1, 3	Table 1.3, 1.5
<i>Varieties grown are identified and labelled</i>	1, 3, 5, 9, 15	Table 1.3
<i>OGTR approved events present for GM seed</i>	19	Table 1.1, 1.3, 1.5
<i>Inventory control of all stocks of seed</i>	3, 5	Table 1.2, 1.3, 1.5
<i>Documented procedures to maintain integrity of product grown</i>	5, 9	Table 1.3
<b>3.3.1 On-Farm Seed Purchase</b>		
<i>Prior to gaining access to the GM seed, growers have signed a technology provider agreement (Stewardship Protocol) and undergone training</i>	3	Table 2.1, 2.6
<i>Growers sign a contract with seed supplier agreeing to comply with any Stewardship Protocols</i>	3	Table 2.1, 2.6
<i>Stewardship Protocols may require the Technology Developer to undertake</i>	3, 19	Table 2.1, 2.3, 2.4, 2.6

Outcome of Process	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>monitoring and reporting of the technology and crop performance to the regulator</i>		
<i>Varieties are identified and labelled</i>	1, 5, 9, 15	Table 1.5, 2.1, 2.6
<i>Growers have a system to manage contractors</i>	3	Table 2.1, 2.3, 2.6
<b>3.3.2 Sowing of Seed On-Farm</b>		
<i>Seed is treated as per label requirements</i>	4	Table 2.1, 2.3, 2.6
<i>Growers plant the seed according to the supplier contract</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Growers plant the seed according to the Technology Provider Crop Management Plan</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Varieties and fields sown are documented</i>	1, 3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Stock control of all seed sown, seed remaining and equipment used</i>	1, 3, 9, 15	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Growers have a system to manage contractors</i>	3	Table 2.1, 2.3, 2.6
<b>3.3.3 Crop Management</b>		
<i>Crop is managed by growers according to best practice principles, the supplier contract, Crop Management Plan and customer requirements</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Relevant records of management practices are maintained</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Regulatory requirements and controls are followed for all husbandry and agronomic practices with regard to growing a GM crop variety</i>	10	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Regular monitoring of relevant fields for volunteer plants from any previous GM crop variety</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Control of volunteer plants as per the Crop Management Plan</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Growers have a system to manage contractors</i>	3	Table 2.1, 2.3, 2.6
<b>3.3.4 On-Farm Harvesting, Handling and Transport</b>		
<i>Growers harvest, transport and otherwise manage the crop according to the supplier contract, Crop Management Plan and customer requirements</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6, 3.1
<i>Growers and contractors use industry best practices to harvest, transport and/or store</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6, 3.1

Outcome of Process	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>the crop</i>		
<i>Equipment and transport units are of an adequate standard to enable insect control</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>Equipment and transport units are in an adequate state of cleanliness to minimise unintended admixture</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>Relevant records of management practices, including details of on-farm grain held in storages are held by the grower</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>Contractors are managed to comply with standard industry guidelines and protocols</i>	3, 6, 7	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>Transport operators are provided with information required to deliver the grain</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6, 3.1
<i>Farmer saved seed is segregated and storages where seed is kept are labelled</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>All storages on farm holding grain stocks are labelled and storages are controlled to minimise unintended admixture</i>	3, 6, 7	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>Samples of harvested grain are tested for a range of quality attributes and retained as required</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6
<b>3.4.1 Grain Receival</b>		
<i>A representative sample for assessment purposes is drawn from the load of grain at the receival point using industry sampling guidelines</i>	3, 21	Table 3.2, 3.3
<i>The grain sampler is adequately trained and conversant with the sampling and testing equipment</i>	3, 14	Table 3.2
<i>Grain in the load tendered for delivery is classified according to industry standards or those of the end-buyer</i>	3, 14, 21	Table 3.2
<i>Dispute and rejection procedures are applied based on the individual storage operator procedures</i>	3, 14, 21	Table 3.2, 3.5
<i>Storage operators have documented receival, storage and clean-down procedures</i>	3, 14	Table 3.2, 3.5
<i>Declarations on the variety, GM status and other factors are made by the person tendering the load for delivery at receival</i>	3, 14	Table 3.2
<i>Consistent declarations are used throughout industry where available</i>	3, 14	Table 3.2
<i>Segregation of grades occurs via the storage</i>	3, 14	Table 3.1, 3.2



Outcome of Process	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>agent allocating a separate grade to each storage unit</i>		
<i>Storage units holding each grade are described appropriately with the grade name</i>	3, 14	Table 3.2
<i>Control of all stock received and held in the storage to preserve the integrity of each grade</i>	3, 14	Table 3.2, 3.5
<b>3.4.2 Grain Storage</b>		
<i>Documented storage procedures to maintain the quality and integrity of the grain through sampling and regular grain inspection during the storage period</i>	3, 14	Table 3.2, 3.3, 3.5
<i>Segregation of grades as per market requirements</i>	3, 14	Table 3.1, 3.2, 3.3
<i>Storage units holding each grade are described appropriately with the grade name</i>	3, 14	Table 3.2, 3.3
<i>Control of all stock received, held and moved throughout the storage facility (if applicable) to preserve the integrity of each grade</i>	3, 14	Table 3.2, 3.3, 3.5
<i>Clean-down procedures of storage facilities and ancillary equipment following grain movement</i>	3, 14	Table 3.3
<b>3.4.3 Grain Consolidation</b>		
<i>Control of all stock received, held and moved throughout the storage facility (if applicable) to preserve the integrity of each grade</i>	3, 14	Table 3.3, 3.4, 3.5
<i>On movement the grain is physically inspected</i>	3, 14	Table 3.3, 3.4
<i>Relevant records are maintained</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Storage operator has documented QA procedures</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Segregation of grades as per market requirements</i>	3, 14	Table 3.1, 3.3, 3.4, 3.5
<i>Transport units to load each grade are described appropriately with the grade name and other relevant information</i>	3, 14	Table 3.3, 3.4
<i>Road and rail transport is managed according to Industry Best Practice Management and customer needs</i>	3	Table 3.3, 3.4, 3.5
<i>Sampling of outloaded grain and retention of samples if required for subsequent testing</i>	3, 14	Table 3.3, 3.4

Outcome of Process	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Clean-down procedures of storage facilities and ancillary equipment following grain movement</i>	3, 14	Table 3.3, 3.4
<i>Storage operators have procedures to manage contractors</i>	3, 14	Table 3.3, 3.4
<b>3.5.1 Grain Outturn – Domestic</b>		
<i>On outloading the grain is physically inspected and sampled</i>	3, 14	Table 3.3, 3.4
<i>Control of all stock outloaded to preserve the integrity of each grade</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Relevant records are maintained</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Storage operator has documented QA procedures</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Transport units to load each grade are described appropriately with the grade name and other relevant information</i>	3, 14	Table 3.3, 3.4
<i>Road and rail transport is managed according to Industry Best Practice Management and customer needs</i>	3	Table 3.3, 3.4, 3.5
<i>Clean-down procedures of storage facilities and ancillary equipment following grain movement</i>	3, 14	Table 3.3, 3.4
<i>Storage operators have procedures to manage contractors</i>	3, 14	Table 3.3, 3.4
<b>3.5.2 Outturn – Export Position</b>		
<i>On outloading the grain is physically inspected and sampled</i>	3, 14	Table 3.3, 3.4
<i>Control of all stock outloaded to preserve the integrity of each grade</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Relevant records are maintained</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Storage operator has documented QA procedures</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Transport units to load each grade are described appropriately with the grade name and other relevant information</i>	3, 14	Table 3.3, 3.4
<i>Road and rail transport is managed according to Industry Best Practice Management and customer needs</i>	3	Table 3.3, 3.4, 3.5
<i>Clean-down procedures of storage facilities and ancillary equipment following grain movement</i>	3, 14	Table 3.3, 3.4
<i>Storage operators have procedures to manage contractors</i>	3, 14	Table 3.3, 3.4

Outcome of Process	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<b>3.6.1 Marketing</b>		
<i>Customer requirements are known</i>	2, 3, 16	Table 3.4
<i>Market acceptance of grain</i>	2, 3, 16	Table 3.4
<i>Marketer contract with relevant participants in the supply chain</i>	3, 16	Table 3.1, 3.4
<i>Description and labelling of grain as per customer contract</i>	2, 3, 16	Table 3.4
<i>Documented regulatory and customer requirements for GM grains for the domestic market</i>	3, 16	Table 3.4
<i>Documented regulatory and customer requirements for GM grains for export markets</i>	2, 3, 16	Table 3.4
<i>Certification of grain as per customer contract</i>	2, 3, 16	Table 3.4
<b>3.6.2 Exporting Grain</b>		
<i>Bags, containers and/or vessel inspected, has passed survey and is deemed fit for loading</i>	3	Table 3.3, 3.4
<i>Export facility pathways are adequately clean to prevent unintended contamination of the cargo to be loaded</i>	3	Table 3.3, 3.4
<i>Grain is inspected during loading by AQIS and meets Australian and the importing country quarantine requirements</i>	2, 3	Table 3.4
<i>On loading the grain is physically inspected and sampled by the export facility operator. Samples may be retained for subsequent analysis</i>	3, 14	Table 3.3, 3.4
<i>Control of all stock loaded to preserve the integrity of each grade</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Relevant records are maintained</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Export facility operator has documented QA procedures</i>	3, 14	Table 3.4, 3.5
<i>Shipment transport units are described appropriately with the grade name and other relevant information</i>	3, 14	Table 3.3, 3.4
<i>Clean-down procedures of facilities and ancillary equipment following grain loading</i>	3, 14	Table 3.3, 3.4
<i>Export facility operators have procedures to manage contractors</i>	3, 14	Table 3.3, 3.4
<i>Documentation to the exporter and vessel owner</i>	2, 3, 14, 21	Table 3.3, 3.4, 3.5

Outcome of Process	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<b>3.7.1 Processing &amp; Manufacturing</b>		
<i>Product received and produced for the customer is segregated to preserve the integrity where required</i>	3	Table 3.6
<i>Relevant records are maintained</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Processing and manufacturing facility operator has documented QA procedures</i>	3, 14	Table 3.4, 3.5
<i>Description and labelling of product as per customer contract and relevant legislation</i>	2, 3, 16, 17, 18	Table 3.4
<i>Clean-down procedures of facilities and ancillary equipment following processing</i>	3, 14	Table 3.3, 3.4
<i>Processing and manufacturing facility operator has procedures to manage contractors</i>	3, 14	Table 3.3, 3.4
<i>Documentation and certification as required to the customer</i>	2, 3, 14, 16, 17, 18	Table 3.3, 3.4, 3.5
<b>3.7.2 Canola Processing</b>		
<i>Grain and product is transported using the appropriate management practice such as the AOF Code of Practice for the Bulk Transport of Vegetable Oilseeds, Meals and Hulls by Road and Rail</i>	3, 21	Table 3.2, 3.3, 3.4, 3.5, 3.6
<i>Stock and inventory control of grain and product</i>	3	Table 3.3, 3.6
<i>Relevant records are maintained</i>	3	Table 3.3, 3.6
<i>Processing facility operator has documented QA procedures</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Description and labelling of product as per customer contract and relevant legislation</i>	3, 17, 18	Table 3.4
<i>Contract terms exist e.g., as listed in the AOF Trading Standards</i>	3, 21	Table 3.4, 3.5, 3.6
<i>Clean-down procedures of facilities and ancillary equipment following processing</i>	3, 14	Table 3.3, 3.4
<i>Documentation and certification as required to the customer</i>	2, 3, 14, 17, 18	Table 3.3, 3.4, 3.5
<b>3.7.3 Stockfeed Use of By-Products</b>		
<i>Product is transported using the appropriate management practice such as the AOF Code of Practice for the Bulk Transport of Vegetable Oilseeds, Meals and Hulls by Road and Rail</i>	3, 21	Table 3.2, 3.3, 3.4, 3.5, 3.6
<i>Stock and inventory control of product</i>	3	Table 3.3, 3.6
<i>Product is segregated where required</i>	3	Table 3.3, 3.6

Outcome of Process	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Relevant records are maintained</i>	3	Table 3.3, 3.6
<i>Product is labelled</i>	3, 17, 18	Table 3.2, 3.3, 3.6
<i>Management systems are available</i>	3, 22	Table 3.3, 3.5, 3.6
<b>3.7.4 Packaging &amp; Retailing</b>		
<i>Stock and inventory control of product</i>	3	Table 3.6
<i>Product is segregated where required</i>	3	Table 3.6
<i>Relevant records are maintained</i>	3	Table 3.6
<i>Product is labelled</i>	3, 17, 18	Table 3.6
<i>Management systems are documented for all practices such as storage, packaging, transport</i>	3	Table 3.5, 3.6

## 2.4 Specific Process Management Tools for Canola

Table 3 outlines a summary of specific tools available to industry for the Process Management of all canola, including GM canola traits, within the Australian supply chain. These have been developed and follow the Principles as outlined that are required to manage all GM grains. Thus, the canola industry has developed the following processes to enable the successful introduction and production of GM canola traits in Australia.

A different list of Reference Material may be required to be developed prior to the release of other GM events.

Some or all of the tools outlined below, or others, may be used depending on the individual circumstances of the supply chain participant and market. Tools may relate to more than one process. Further information is detailed in Section 3 of this report.

**Table 3: Summary of Process Management Tools for Canola**

Process	Reference Material
Technology	No specific canola requirements necessary
Breeding	ASF Best Practice Guidelines for Management of Adventitious Presence in Canola Varieties
On-Farm Production	Stewardship Protocols, including Crop Management Plan
	ASF National Code of Practice for Seed Labelling and Marketing
	Seed Supplier Contract (where required)
Accumulation & Storage	NACMA/AOF GM Grower Declaration
	NACMA/AOF Canola Trading Standards
	AOF definition for unintended adventitious presence of approved GM events in non-GM canola
Grain Outturn	NACMA/AOF Canola Trading Standards
Marketing & Export	OGTR approved event
	Approval in importing countries
	Establishment of AP thresholds in Australia and in importing countries
	Importing country GM certification requirements by AQIS (where required)
End-Product Manufacture	AOF Code of Practice for the Bulk Transport of Vegetable Oilseeds, Meals and Hulls by Road and Rail
	AOF Code of Practice for the Bulk Transport of Vegetable Oils by Road and Rail

### **3. Process Management within Sectors of the Supply Chain**

The following section outlines the Principles required to be managed at all stages in the supply chain in order to meet customer requirements in the final product. Relevant tools and information to assist industry to comply with these Principles and achieve the desired outcome is outlined for each stage.

The following headings are used throughout this section:

- Definition – explains the nature of the process to be managed
- Rationale – describes the reasoning behind the requirements checklist and process management tools applicability
- Outcome Required – summary table of outcomes
- Verification – lists specific tools available for use to verify the product

Reference sources listed in the following section are listed by number:

- Appendix 1 - Technical Reference Documents
- Appendix 6 - The former GTGC Stewardship Principles

Note there are other General Reference Documents listed in Appendix 2 that readers may find useful when seeking further information.

## **3.1 Technology Development**

### **3.1.1 Gene Technology Research**

#### **Definition**

Research in a contained laboratory or field by the breeder determines characteristics (traits) by crop such as abiotic and biotic stress or grain quality potentially suitable for commercialisation.

Refers to OGTR approved research events.

#### **Rationale**

Both GM and non-GM traits may be researched.

Plant breeding material or germplasm either within Australia or in overseas breeding centres is reviewed to determine the need and likely benefits for a trait of interest to the Australian grains industry.

Once approval is granted by the OGTR and AQIS, imported GM material is accompanied with a declaration regarding its GM status. AQIS approve the importation of donor seed germplasm with GM traits that have been licensed with the OGTR.

All imported GM material is approved by the OGTR whereas non-GM material does not require OGTR approval.

Research on GM material is conducted under OGTR licence conditions to minimise the potential for the unintended presence of the GMO material in non GM breeding lines.

Traits present in the donor seed germplasm as either OGTR approved or OGTR approved research events, are identified and labelled

The test for a GM trait is generally not a commercial test at this stage; rather a PCR based test although a range of other test methods are generally available (e.g., protein detection methods).

Research may occur on OGTR unapproved GM events under contained conditions (e.g., OGTR Approved PC2 laboratories and/or glasshouses). The breeder is required to advise the OGTR of this rather than describe every event to be researched.

If the trait is present in an AQIS nominated restricted species, any imported seed germplasm will usually need to be grown for a generation under AQIS and OGTR supervision in an AQIS and OGTR PC2 approved quarantine facility



If a restricted species, any imported seed will usually need to be grown for a generation under AQIS supervision in an AQIS approved quarantine facility.

Experimental traits contained within the selected crop germplasm are researched and those failing the rigorous and substantive testing regime and therefore deemed unsuitable for commercialisation, are destroyed. The research material selected for progression then proceeds into a range of rigorous screens before seed crops or commercial grain crops are produced with varieties derived from the laboratory. The research material containing the selected trait within the preferred germplasm does not enter the commercial grain trade.

### Outcomes Required

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Access to suitable traits such as abiotic and biotic stress, grain quality and processing traits</i>	n/a	Table 1.1
<i>Traits present in the donor seed germplasm are either OGTR approved or OGTR approved research events</i>	19	Table 1.1
<i>Traits are identified and labelled</i>	5	Table 1.1
<i>Imported GM material is accompanied by a declaration</i>	3	Table 1.1
<i>The OGTR and AQIS signoff on imported GM material</i>	3	Table 1.1
<i>AQIS provide an import permit for seed classified as a non-restricted species</i>	3	Table 1.1
<i>Research on GM material is conducted under OGTR licence conditions to minimise the potential for the unintended presence of the GM material in non GM breeding lines</i>	3	Table 1.1
<i>Breeding organisations have internal protocols for managing research events</i>	3	Table 1.1
<i>Research companies have documented procedures</i>	9, 13, 15	Table 1.1

### Verification Methods

Prior to gaining approval to develop a GM trait, a DNA test method is available and provided to the OGTR.

GM testing of the imported trait may occur depending on the origin of the material (refer Appendix 1 Technical Reference 3 and Appendix 6 Stewardship Principles Tables 1.1 & 1.4 for further information).

## **3.2 Breeding**

### **3.2.1 Breeding Nurseries**

#### **Definition**

Germplasm containing the new traits is developed into new varieties via selection (i.e. breeding lines) in small plots to study the effect of the new trait versus existing varieties. Field trial small plots may also be used to increase the seed bank and to cross genotypes as part of the development of new varieties.

This may refer to:

- The development of breeding lines from germplasm containing either OGTR approved or OGTR approved research events, or
- The development of breeding lines from non-GM germplasm

#### **Rationale**

Both GM traits and non-GM traits of interest are researched in their respective breeding lines.

Breeding nurseries are under the direct supervision of the breeder. Where GM material is researched these nurseries operate under OGTR licences and supervision.

The area of any one nursery varies depending on the individual breeding strategy applied. Where breeding lines containing GM events of interest are grown the entire nursery is treated as a GM nursery, operating under pre-determined OGTR conditions.

Where and when required as part of the breeding strategy, the GM test method is used to determine the presence or absence of the trait in the material within the breeding nursery.

Non-GM breeding nurseries for the development of new varieties are not supervised by the OGTR unless they are grown together with OGTR approved research events.

The seed harvested from an OGTR supervised breeding nursery does not directly enter the commercial grain trade.

Harvested seed from either a GM and/or a non-GM breeding nursery goes through a rigorous screen before seed crops or commercial grain crops are produced with varieties derived from the nursery.

**Outcomes Required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Non-GM breeding lines grown are identified and labelled</i>	1, 5, 9, 15	Table 1.2
<i>OGTR approved or OGTR approved research events in GM breeding lines are identified and labelled</i>	1, 5, 9, 15	Table 1.2
<i>A test method for detection of the GM trait is available</i>	3	Table 1.2
<i>GM nurseries operate under OGTR licences and supervision</i>	3, 19	Table 1.1
<i>Breeding companies have documented procedures to maintain integrity of product</i>	5	Table 1.2, 1.3

**Verification Methods**

A DNA test method must be available and provided to the OGTR for detection of the GM trait.

There is no specific or mandatory need to test for the presence of GM however testing may occur as required by the breeder (refer Appendix 1 Technical Reference 3 and Appendix 6 Stewardship Principles Tables 1.1 & 1.4 for further information).

### **3.2.2 Multi-Location Field Trials**

#### **Definition**

Field plots in locations across the agro-ecological growing environment where the new varieties bred in the laboratory or breeding nursery are grown under the direct supervision of the breeder.

New crop varieties are bred in small plots to study their performance versus existing varieties across a range of environments. The small plots are also used to increase the seed bank for further use by the breeder in trials that focus on yield and quality performance, together with further assessment of the agronomic performance of the new varieties versus industry standards.

This refers to non-GM varieties and GM varieties in multi-location field trials containing OGTR approved or OGTR approved research events.

#### **Rationale**

Both GM and non-GM traits are researched.

All OGTR approved or OGTR approved research events in multi-location field trials are managed under the OGTR Risk Assessment and Risk Management Plan.

Testing of this material by the breeder for the specific GM event of interest may occur for internal QA and research purposes.

As GM multi-location variety field trials are generally grown in separate locations from non-GM multi-location field trials, testing for the presence or absence of a GM event of interest is not required.

If GM multi-location variety trials are co-located on the same trial site as non-GM multi-location variety trials then the co-located trial site is treated as a GM crop trial managed under OGTR licence conditions. Testing for the presence or absence of a GM event of interest in the non-GM varieties is recommended by the Australian Seeds Federation (refer to ASF Best Management Practice Guidelines for Sowing Seed).

The product from multi-location variety trials does not directly enter the commercial grain trade. Harvested seed from the trials will go through a rigorous screen before seed crops or commercial grain crops are produced with varieties derived from the trials.

The ASF has established Best Management Practice Guidelines for Sowing Seed for canola planting seed which has been adopted by the seed industry participants who plant canola. Breeders may choose to have their varieties sown under these Guidelines.

**Outcomes Required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Varieties grown are identified and labelled</i>	1, 5, 9, 15	Table 1.2, 1.3
<i>GM material is associated with a test method for detection of the GM event</i>	3	Table 1.2, 1.3
<i>Breeding companies have documented procedures to maintain integrity of product grown in these trials</i>	5	Table 1.2, 1.3
<i>Seed is grown under an appropriate Certification Scheme or Management System such as the ASF Best Practice Guidelines for Sowing Seed for canola</i>	1, 3, 9, 15	Table 1.2, 1.3

**Verification Methods**

A DNA test method must be available for detection of the GM trait.

There is no specific or mandatory need to test for the presence of GM however testing may occur as required by the breeder (refer Appendix 1 Technical Reference 3, 12 and Appendix 6 Stewardship Principles Tables 1.1 & 1.4 for further information).

### **3.2.3 Variety Commercialisation**

#### **Definition**

Breeders' seed is released for commercial production.

This refers to non-GM crop varieties and/or GM crop varieties in breeder seed grown in commercial seed bulk up fields containing OGTR approved events.

#### **Rationale**

Both GM and non-GM crop varieties may be commercialised.

The variety must pass all agronomic and quality attribute testing prior to commercial release for uptake by grain growers. Markets must accept the crop from a commercial and regulatory viewpoint.

The breeder together with the seed company has made the decision and intends to progress the new GM, non-GM or speciality variety for seed production and commercial release for sale to grain growers.

For GM crops, test results demonstrate that no OGTR unapproved events are detected and confirm the presence of the approved OGTR event in the crop. The degree of testing for the GM event varies depending on the industry/regulatory standard required for market access and/or the breeding company internal requirements. Following this testing, the variety should progress to the planting seed bulk up stage.

This process is pivotal for effective control of unapproved GM traits entering the commercial planting seed and grain market. This stage may occur before or at the same time as trialling in the NVT program.

The ASF has established Best Practice Management Guidelines for Sowing Seed for canola planting seed which has been adopted by the canola planting seed industry participants. Breeders may choose to have their varieties sown under these Guidelines.

**Outcomes Required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Varieties have passed all agronomic and quality attribute tests</i>	3	Table 1.2, 1.3
<i>Varieties are labelled</i>	1, 5, 9, 15	Table 1.3, 1.5
<i>OGTR approved events present for GM seed</i>	19	Table 1.1, 1.3, 1.5
<i>Inventory control of all stocks of seed</i>	5	Table 1.2, 1.3, 1.5
<i>Market acceptance in key importing and exporting countries</i>	3, 14, 21	Table 2.2, 3.2, 3.4

**Verification Methods**

For GM varieties, testing confirms the presence of the OGTR approved event and the absence of specific unwanted events for GM varieties (refer Appendix 1 Technical Reference 3, 12, 13 & 20 and Appendix 6 Stewardship Principles Tables 1.2, 1.3 & 1.4 for further information).

For non-GM crops, testing confirms the level at which an OGTR approved GM event is present within established industry standards for adventitious presence in planting seed (such as those outlined in the ASF Best Practice Management Guidelines for Sowing Seed). Refer Appendix 1 Technical Reference 3, 12, 13 & 20 and Appendix 6 Stewardship Principles Tables 1.2, 1.3 & 1.4 for further information).

### 3.2.4 Basic (Foundation) Seed

#### Definition

Seed is grown by a number of growers to increase seed for sale for commercial grain production.

This refers to non-GM crop varieties or those containing OGTR approved events.

#### Rationale

Both GM and non-GM traits may be commercialised.

The ASF has established a Best Practice Management Guidelines for Sowing Seed for canola planting seed which has been adopted by the canola planting seed industry participants. Breeders may choose to have their varieties sown under these Guidelines.

For other crops these Guidelines are yet to be developed as required. Growers to undertake this stage may be selected by the breeding company for this stage, or the breeding company may implement this stage themselves with production of seed in-house.

Seed is grown at a number of locations across the crop growing area.

The breeding company may also test this material for agronomic and quality attributes to confirm the appropriate traits remain in the seed.

#### Outcomes Required

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Seed grown under an appropriate Certification Scheme or Management System such as the ASF Best Practice Guidelines for Sowing Seed for canola or the OECD seed certification scheme</i>	1, 3, 5, 9, 15	Table 1.2, 1.3
<i>Seed is grown in sufficient quantities for commercial sale</i>	1, 3	Table 1.3, 1.5
<i>Varieties grown are identified and labelled</i>	1, 3, 5, 9, 15	Table 1.3
<i>OGTR approved events present for GM seed</i>	19	Table 1.1, 1.3, 1.5
<i>Inventory control of all stocks of seed</i>	3, 5	Table 1.2, 1.3, 1.5
<i>Documented procedures to maintain integrity of product grown</i>	5, 9	Table 1.3



### **Verification Methods**

For GM crop varieties, testing confirms the presence of the OGTR approved event and the absence of specific unwanted events (refer Appendix 1 Technical Reference 5 & 13 and Appendix 6 Stewardship Principles Tables 1.3 & 1.4 for further information).

For non-GM crop varieties testing confirms that if an OGTR approved GM event is present, the level at which it is present is within established industry standards for adventitious presence in planting seed (refer to the ASF Best Practice Management Guidelines for Sowing Seed for details of the recommended sampling and testing regime for non-GM canola). Refer Appendix 1 Technical Reference 3, 12, 13 & 20 and Appendix 6 Stewardship Principles Tables 1.3 & 1.4 for further information.

### **3.3 On-Farm Production**

#### **3.3.1 On-farm Seed Purchase**

##### **Definition**

Seed is purchased by growers for the purpose of producing a crop for commercial sale.

This refers to non-GM crop varieties or those GM crop varieties containing OGTR approved events.

##### **Rationale**

Both GM and non-GM seed may be purchased.

Technology Providers and/or their seed company licensee partners have developed each variety under conditions that optimise agronomic and technology performance. Best Stewardship Protocols will generally relate to the management of the crop in relation to the specified trait of interest (e.g. herbicide or insect resistance management strategies). The Management Practices in growing that variety and achieving maximum performance are outlined in the Crop Management Plan provided by the Seed Company and/or Technology Provider to the grower.

The grower agrees to comply with all requirements stipulated in the seed company contract and/or the Technology Provider Crop Management Plan and where appropriate the associated Stewardship Protocols. The seed company and/or the Technology Provider will generally initiate a training program with the grower covering the Crop Management Plan and the implementation of the associated Stewardship Protocols.

By following the Crop Management Plans and the associated Stewardship Protocols, the grower has a high level of confidence the variety will perform as per the conditions stated by the seed supplier.

Growers' obligations may relate to pre-described Stewardship Protocols developed for the technology that is deemed mandatory by a regulator e.g. APVMA or OGTR.

All seed is labelled.

**Outcomes Required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Prior to gaining access to the GM seed, growers have signed a technology provider agreement (Stewardship Protocol) and undergone training</i>	3	Table 2.1, 2.6
<i>Growers sign a contract with seed supplier agreeing to comply with any Stewardship Protocols</i>	3	Table 2.1, 2.6
<i>Stewardship Protocols may require the Technology Developer to undertake monitoring and reporting of the technology and crop performance to the regulator</i>	3, 19	Table 2.1, 2.3, 2.4, 2.6
<i>Varieties are identified and labelled</i>	1, 5, 9, 15	Table 1.5, 2.1, 2.6

**Verification Methods**

GM seed is appropriately certified (refer Appendix 1 Technical Reference 3, 12 & 13 and Appendix 6 Stewardship Principles Tables 1.4, 1.5, 2.1 & 2.6 for further information).

### **3.3.2 Sowing of Seed on-farm**

#### **Definition**

Seed is planted in the field by growers for the purposes of producing a crop for commercial sale or for on-farm use.

This refers to non-GM crop varieties and GM crop varieties containing OGTR approved GM events.

#### **Rationale**

Seed sown may be non-GM crop varieties or GM crop varieties.

Where a grower chooses to apply seed treatments “on farm” in order to protect against attack by pests during the growing period, it is required that all treatments are applied as per registered label requirements to protect against attack by pests during the growing period.

Sowing according to recommended practices as per the supplier contract and other sources of agronomic advice is vital for the grower to maximise potential performance (i.e. yield and quality) of the crop variety and where present the performance of the GM trait.

Records are kept to maintain and verify the integrity of the crop sown and any remaining seed. This enables the grower to manage unintended presence in the sown crop or other crops grown on their farm.

Stock control and identification of the variety is needed when delivering the grain to the marketplace.

Where the grower uses contractors to sow the seed, the grower needs to ensure that the contractor attests to compliance with best practice principles and protocols outlined in the seed company agreement and/or the Technology Provider Crop Management Plan and associated Stewardship Protocols.

**Outcomes Required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Seed is treated as per label requirements</i>	4	Table 2.1, 2.3, 2.6
<i>Growers plant the seed according to the supplier contract</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Growers plant the seed according to the Technology Provider Crop Management Plan</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Varieties and fields sown are documented</i>	1, 3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Stock control of all seed sown, seed remaining and equipment used</i>	1, 3, 9, 15	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Growers have a system to manage contractors</i>	3	Table 2.1, 2.3, 2.6

**Verification Methods**

Documentation to keep records of all seed sown, seed remaining and equipment used (refer Appendix 1 Technical Reference 1, 3, 9 & 15 and Appendix 6 Stewardship Principles Tables 2.1, 2.3, 2.4, 2.5 & 2.6 for further information).

### **3.3.3 Crop Management**

#### **Definition**

Growers manage the growing crop, often with the assistance of agricultural advisors, from the time of sowing until the point of harvest.

This refers to non-GM crop varieties, specialty crops and GM crop varieties containing OGTR approved events.

#### **Rationale**

Agronomic best management practices must include all aspects of crop treatment such as fertiliser application and all manner of controls such as weed, disease, pest and vermin.

Volunteer plants from the previous crop must be removed, as they are a key threat with regard to adventitious presence threshold contamination of other crops and as a consequence, other grains.

The growing crop must be managed based on the prevailing environmental and crop conditions in order to achieve its maximum potential. Some of the issues faced will be foreseen and others unforeseen. For unforeseen circumstances such as vermin entry or weed infestation, best management practices are to be followed. All management is done with the end-user (customer) in mind and nothing is done to compromise the integrity of the crop.

Records are kept as per any relevant Federal, State or Territory legislation or where required by the market (supply chain).

Industry best management practices are followed where relevant, including the use of any on-farm QA systems.

All conditions as stated in the Stewardship Protocol for GM crops, the seed supplier contract for other crops or those required by the market must be followed.

Where the grower uses contractors to carry out any of these crop management functions, the grower must monitor the contractor to ensure compliance with best practice guidelines and any other requirements stipulated under the seed supplier contract or Crop Management Plan.

**Outcomes Required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Crop is managed by growers according to best practice principles, the supplier contract, Crop Management Plan and customer requirements</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Relevant records of management practices are maintained</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Regulatory requirements and controls are followed for all husbandry and agronomic practices with regard to growing a GM crop variety</i>	10	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Regular monitoring of relevant fields for volunteer plants from any previous GM crop variety</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Control of volunteer plants as per the Crop Management Plan</i>	3	Table 2.1, 2.3, 2.4, 2.5, 2.6
<i>Growers have a system to manage contractors</i>	3	Table 2.1, 2.3, 2.6

**Verification Methods**

Quality systems are used to assist management on-farm (refer Appendix 1 Technical Reference 3 & 16 and Appendix 6 Stewardship Principles Tables 2.1, 2.2, 2.3, 2.4, 2.5 & 2.6 for further information).

### **3.3.4 On-Farm Harvesting, Handling & Transport**

#### **Definition**

The crop is harvested, stored on-farm and/or transported for storage at a grain receival facility.

This refers to non-GM crop varieties, specialty crops and GM crop varieties containing OGTR approved events.

#### **Rationale**

The process of harvesting, seed cleaning (where necessary), storing and transporting the crop is managed to preserve the integrity of the crop variety and minimise contamination as well as to maximise yield and quality potential. Where required, growers will carryout all processes as outlined in the seed supplier contract or marketing contract.

With a GM crop variety the grower needs to ensure crop/grain harvesting, grain cleaning (where necessary), on-farm grain storage and/or grain transport comply with best practice principles and protocols outlined in the seed company agreement and/or the technology provider Crop Management Plan and associated Stewardship Protocols.

Growers must seek declarations to satisfy themselves that contractors comply with industry best practice guidelines. All contractors (harvesters, seed cleaners, transport operators) are to be monitored and controlled to assist in preserving the integrity of the grain. Following relevant industry best practice guidelines produced by industry sectors such as the Australian Grain Harvesters Association Best Management Practices and commercial seed cleaners will assist.

The process of moving the grain from the field to the storage on-farm should occur using best management practice.

On-farm storages and associated equipment used must be of an adequate standard to preserve the integrity and quality of the grain and enable insect control where required. Prior to storing the grain, all equipment and storages must be inspected and cleaned to an appropriate state of cleanliness to minimise any unintended admixture.

Records of all relevant management practices are kept by the grower to assist maintaining the integrity of the grain. All storages holding grain are documented and relevant security measures are undertaken to minimise unintended admixture.

Samples of the harvested crop may be retained to assist the grower to resolve any disputes post-delivery of the grain.

Where grain is destined for a central storage silo (grain receival facility) or market (end-user), transport equipment must be of an adequate standard. Prior to loading of the grain, the transport operator or contractor must have inspected and cleaned the transport equipment using best practice road transport guidelines.



The transport operator or contractor is supplied with the information detailing the variety, GM status of the grain and other information where required. This ensures the receiver of the grain (receival point) is aware of the variety and GM status and minimises any potential for unintended admixture during receipt and storage.

Where seed is saved it must be segregated and labelled to control the risk of contamination.

The grower may test the grain for various quality attributes prior to transporting the grain ex-farm.

### Outcomes Required

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Growers harvest, transport and otherwise manage the crop according to the supplier contract, Crop Management Plan and customer requirements</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6, 3.1
<i>Growers and contractors use industry best practices to harvest, transport and/or store the crop</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6, 3.1
<i>Equipment and transport units are of an adequate standard to enable insect control</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>Equipment and transport units are in an adequate state of cleanliness to minimise unintended admixture</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>Relevant records of management practices, including details of on-farm grain held in storages are held by the grower</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>Contractors are managed to comply with standard industry guidelines and protocols</i>	3, 6, 7	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>Transport operators are provided with information required to deliver the grain</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6, 3.1
<i>Farmer saved seed is segregated and storages where seed is kept are labelled</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>All storages on farm holding grain stocks are labelled and storages are controlled to minimise unintended admixture</i>	3, 6, 7	Table 2.1, 2.2, 2.3, 2.5, 2.6
<i>Samples of harvested grain are tested for a range of quality attributes and retained as required</i>	3	Table 2.1, 2.2, 2.3, 2.5, 2.6

**Verification Methods**

There is no specific or mandatory need to test for the presence of GM material to ensure compliance to QA standards. Testing may occur as required by the customer or as determined by the grower to ensure compliance with specifications or tolerance levels. Grain may be tested for various other quality attributes (refer Appendix 1 Technical Reference 3 and Appendix 6 Stewardship Principles Tables 2.1, 2.2, 2.3 & 2.6 for further information).

### **3.4 Accumulation & Storage**

#### **3.4.1 Grain Receival**

##### **Definition**

The grain is tendered for delivery at a storage facility (receival point) with appropriate declarations.

The storage agent samples and then tests the grain (load) and either accepts or rejects it.

##### **Rationale**

Grain receival facility operators apply common industry sampling and testing protocols to all loads prior to acceptance or rejection. Grain samplers are adequately trained and are conversant with all sampling and testing equipment. Equipment is maintained to an appropriate standard.

Segregations are created based on market requirements, as are clean-down procedures during the receival process. Standards applied to each grain type control the level of admixture of other grain types within industry requirements. The silo operator at the grain receival facility classifies the grain according to National Agricultural Commodities Marketing Association (NACMA) Standards or where necessary to end-buyer (user) standards.

The person tendering the load for delivery provides a declaration attesting to the grain type, variety, GM status and quality assurance status (risk of chemical residue) of the grain.

The storage agent and the grower or the grower's agent generally signs a delivery document that includes the date, grain variety, grain type and/or category, and the delivery point (usually identifies the silo, bin or hopper). This declaration is used by the storage operator to determine whether any further testing of the GM status (refer to NACMA grower delivery declarations) is needed to meet customer requirements.

Following assessment grain is classified and unloaded into the appropriate storage.

If unhappy with the storage agent's determination (quality) then a re-sample and re-test may be asked for by the person tendering the load for delivery. If still dissatisfied the grower or the grower's agent have the right to not deliver the grain load to the receival facility.

Declarations by growers on the GM status may be sufficient where the grain tendered for delivery has not been intentionally exposed to GM seed or plants either during seed production or in handling. Depending on the declaration, procedures used by the individual storage operators and market requirements, subsequent testing of a sub-sample taken at the bin or hopper (monitoring of 'stack' or 'silo' average) may occur for comparison with retained samples.

Various samples may need to be taken for further analysis or verification of the declaration at receipt based on the risk assessment by the storage agent. These may be retained on site or forwarded to another location for subsequent analysis for a range of quality parameters. Additional samples may be retained on site for other purposes.

Where there is the potential for unknown contamination of the grain which cannot be assessed at receipt, the grain handler will use their "in-house" protocols based on risk assessment to determine whether the grain should be received, where it will be stored and whether samples should be taken for subsequent testing prior to out-loading.

The need for and the procedures used to 'clean-down' handling equipment are based on the storage facilities own internal protocols. Storage operators implement and monitor the cleaning of equipment and handling facilities to maintain the integrity of the grain within industry or marketplace accepted contamination levels, based on market needs and requirements.

The storage operator checks the documentation of each delivery (load) prior to unloading the grain to ensure the integrity of the grain within the storage facility will be maintained. The storage agent then monitors the discharge of the grain into the correct storage receipt point (silo, bin or hopper).

**Outcomes Required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>A representative sample for assessment purposes is drawn from the load of grain at the receival point using industry sampling guidelines</i>	3, 21	Table 3.2, 3.3
<i>The grain sampler is adequately trained and conversant with the sampling and testing equipment</i>	3, 14	Table 3.2
<i>Grain in the load tendered for delivery is classified according to industry standards or those of the end-buyer</i>	3, 14, 21	Table 3.2
<i>Dispute and rejection procedures are applied based on the individual storage operator procedures</i>	3, 14, 21	Table 3.2, 3.5
<i>Storage operators have documented receival, storage and clean-down procedures</i>	3, 14	Table 3.2, 3.5
<i>Declarations on the variety, GM status and other factors are made by the person tendering the load for delivery at receival</i>	3, 14	Table 3.2
<i>Consistent declarations are used throughout industry where available</i>	3, 14	Table 3.2
<i>Segregation of grades occurs via the storage agent allocating a separate grade to each storage unit</i>	3, 14	Table 3.1, 3.2
<i>Storage units holding each grain are described appropriately with the grade name</i>	3, 14	Table 3.2
<i>Control of all stock received and held in the storage to preserve the integrity of each grade</i>	3, 14	Table 3.2, 3.5

**Verification Methods**

There is not a specific or mandatory need to test each load for the presence of GM material to ensure compliance to industry standards. The testing may occur as required by the customer or as determined by the receival site operator to ensure compliance with specifications or tolerance levels set by the marketplace.

Appropriate analytical assessment processes are available to determine the GM content of the grain. Rapid tests are available for current GM canola events or more elaborate laboratory based tests are available.

Refer to Appendix 1 Technical Reference 3, 11, 14 & 16 and Appendix 6 Stewardship Principles Tables 3.2, 3.3 & 3.5 for further information.

### 3.4.2 Grain Storage

#### Definition

The grain is stored on-site at the storage receival facility until out-turned.

#### Rationale

Industry applies common sampling and inspection protocols to all grain stored within a storage site. Segregations that have been created based on market requirements are maintained and documentation on the location of grain is maintained.

Where grain is moved within the facility, the storage operator maintains records and the grain continues to be segregated as per its receival status and market requirements.

Where there is the potential for subsequent contamination of delivered grain due to the use of common handling and storage facilities, the grain handler will use its “in-house” protocols based on risk assessment to determine whether the grain should be tested prior to out-loading.

Various samples may need to be taken for verification of the declarations at receival or for verification of the suitability of the grain for a particular end-user (customer).

Procedures for cleaning down of storage and handling equipment are based on market requirements and the storage operator’s internal Quality Assurance (QA) systems and procedures. Similarly, sampling and inspection rates are determined by these protocols and QA systems.

#### Outcomes required

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Documented storage procedures to maintain the quality and integrity of the grain through sampling and regular grain inspection during the storage period</i>	3, 14	Table 3.2, 3.3, 3.5
<i>Segregation of grades as per market requirements</i>	3, 14	Table 3.1, 3.2, 3.3
<i>Storage units holding each grade are described appropriately with the grade name</i>	3, 14	Table 3.2, 3.3
<i>Control of all stock received, held and moved throughout the storage facility (if applicable) to preserve the integrity of each grade</i>	3, 14	Table 3.2, 3.3, 3.5
<i>Clean-down procedures of storage facilities and ancillary equipment following grain movement</i>	3, 14	Table 3.3

**Verification Methods**

There is not a specific or mandatory need to sample and test stored grain for the presence of GM material to ensure compliance to industry standards. The testing may occur as required by the customer or as determined by the receival site operator internal audit procedures to ensure compliance with specifications or tolerance levels set by the marketplace.

Appropriate analytical assessment processes are available to determine the GM content of the grain. Rapid tests are available for current GM canola events or more elaborate laboratory based tests are available.

Refer to Appendix 1 Technical Reference 3, 11, 14 & 16 and Appendix 6 Stewardship Principles Tables 3.3 & 3.5 for further information.

### **3.4.3 Grain Consolidation**

#### **Definition**

The grain is out-loaded from the original storage site (receival facility) where the grower delivered and transported by road or rail to another storage facility for consolidation prior to transporting to an export terminal or for use by the domestic market.

#### **Rationale**

Most processes occur as per Grain Outturn-Domestic or Export.

Storage operators inspect grain on movement and review documentation to check the correct grain is moved from storage.

Best management practices are in place to assist transport operators to maintain the quality and integrity of the grain and prevent unintentional contamination. This involves inspection, cleaning and use of dedicated transport units as needed by the market.

Documentation is provided to the transport operator or their agent, which must be given to the operator of the next receiving facility, attesting to the quality, grade description and integrity of the grain.

Storage operators ensure that their own staff and any contractors used comply with the storage operator's QA systems and procedures.

Procedures for cleaning down of storage and handling equipment are based on market requirements and the storage operator's internal Quality Assurance (QA) systems and procedures. Similarly, sampling and inspection rates are determined by these protocols and QA systems.

Grain may be out-loaded immediately it is received or it may be stored for a period. If stored, the storage operator's internal procedures and QA system will dictate whether samples will be taken and/or tested prior to out-loading.

On receipt of the grain at the subsequent storage or consolidation facility, the storage operator's internal procedures and QA system will dictate whether samples will be taken and/or tested.



**Outcomes required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Control of all stock received, held and moved throughout the storage facility (if applicable) to preserve the integrity of each grade</i>	3, 14	Table 3.3, 3.4, 3.5
<i>On movement the grain is physically inspected</i>	3, 14	Table 3.3, 3.4
<i>Relevant records are maintained</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Storage operator has documented QA procedures</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Segregation of grades as per market requirements</i>	3, 14	Table 3.1, 3.3, 3.4, 3.5
<i>Transport units to load each grade are described appropriately with the grade name and other relevant information</i>	3, 14	Table 3.3, 3.4
<i>Road and rail transport is managed according to Industry Best Practice Management and customer needs</i>	3	Table 3.3, 3.4, 3.5
<i>Sampling of outloaded grain and retention of samples if required for subsequent testing</i>	3, 14	Table 3.3, 3.4
<i>Clean-down procedures of storage facilities and ancillary equipment following grain movement</i>	3, 14	Table 3.3, 3.4
<i>Storage operators have procedures to manage contractors</i>	3, 14	Table 3.3, 3.4

**Verification Methods**

There is not a specific or mandatory need to sample and test grain for the presence of GM material to ensure compliance to industry standards. The testing may occur as required by the customer or as determined by the receival site operator internal audit procedures to ensure compliance with specifications or tolerance levels set by the marketplace.

Appropriate analytical assessment processes are available to determine the GM content of the grain. Rapid tests are available for current GM canola events or more elaborate laboratory based tests are available.

Refer to Appendix 1 Technical Reference 3 & 14 and Appendix 6 Stewardship Principles Tables 3.3 & 3.5 for further information.

### **3.5 Grain Outturn**

#### **3.5.1 Grain Outturn – Domestic**

##### **Definition**

The grain is out-loaded from the storage facility and transported to the domestic market by road or rail transport.

The grower may deliver the grain ex-farm direct to the domestic market. In that case, the end buyer may apply the same protocols as a grain accumulator (grain receival facility).

##### **Rationale**

On outturn, the storage agent is responsible to out-load the correct grain type and quality. This is done via checking their documentation records.

Grain is physically inspected and/or sampled as it is loaded to ensure compliance with contract terms and conditions and to ensure no quality deterioration has occurred during the storage period. Samples may be retained. Documentation is provided with the grain so the receiver of the grain is aware of the identity and quality status of the grain.

Best management practices are in place to assist transport operators to maintain the quality and integrity of the grain and prevent unintentional contamination. This involves inspection, cleaning and use of dedicated transport units as needed by the market.

Storage operators ensure that their own staff and any contractors used to outload grain comply with the storage operator's QA systems and procedures.

Procedures for cleaning down of storage and handling equipment are based on market requirements and the storage operator's internal Quality Assurance (QA) systems and procedures. Similarly, sampling and inspection rates are determined by these protocols and QA systems.

Grain is received at the domestic end-user and either consolidated or identity preserved as per their market requirements. Grain may be immediately used/processed or stored for a period. In either case, marketplace and customer requirements and internal procedures documented by the operator of the facility dictate any identity preservation, sampling and testing processes to occur.

**Outcomes required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>On outloading the grain is physically inspected and sampled</i>	3, 14	Table 3.3, 3.4
<i>Control of all stock outloaded to preserve the integrity of each grade</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Relevant records are maintained</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Storage operator has documented QA procedures</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Transport units to load each grade are described appropriately with the grade name and other relevant information</i>	3, 14	Table 3.3, 3.4
<i>Road and rail transport is managed according to Industry Best Practice Management and customer needs</i>	3	Table 3.3, 3.4, 3.5
<i>Clean-down procedures of storage facilities and ancillary equipment following grain movement</i>	3, 14	Table 3.3, 3.4
<i>Storage operators have procedures to manage contractors</i>	3, 14	Table 3.3, 3.4

**Verification Methods**

There is not a specific or mandatory need to sample and test grain for the presence of GM material to ensure compliance to industry standards. The testing may occur as required by the customer or as determined by the receival site operator internal audit procedures to ensure compliance with specifications or tolerance levels set by the marketplace.

Appropriate analytical assessment processes are available to determine the GM content of the grain. Rapid tests are available for current GM canola events or more elaborate laboratory based tests are available.

Refer to Appendix 1 Technical Reference 3, 14 & 21 and Appendix 6 Stewardship Principles Tables 3.3, 3.4 & 3.5 for further information.

### **3.5.2 Grain Outturn – Export**

#### **Definition**

The grain is out-loaded from the storage facility or consolidation facility and transported by road or rail to the export terminal.

#### **Rationale**

On outturn, the storage agent is responsible to out-load the correct grain type and quality. This is checked through their documentation records.

Grain is physically sampled as it is loaded to ensure compliance with contract terms and conditions and to ensure no quality deterioration or contamination has occurred during the storage period. Samples may be retained. Documentation is provided with the grain so the receiver of the grain is aware of the identity and quality status of the grain.

Best management practices are in place to assist transport operators to maintain the quality and integrity of the grain and prevent unintentional contamination. This involves inspection, cleaning and use of dedicated transport units as needed by the market.

Storage operators ensure that their own staff and any contractors used to outload grain comply with the storage operator's QA systems and procedures.

Grain is received at the export terminal and either consolidated or segregated as per market requirements. Grain may be immediately exported or stored for a period. In either case, marketplace and customer requirements and internal procedures documented by the operator of the export terminal, dictate identity preservation, clean down, sampling and testing processes to occur.

**Outcomes Required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>On outloading the grain is physically inspected and sampled</i>	3, 14	Table 3.3, 3.4
<i>Control of all stock outloaded to preserve the integrity of each grade</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Relevant records are maintained</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Storage operator has documented QA procedures</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Transport units to load each grade are described appropriately with the grade name and other relevant information</i>	3, 14	Table 3.3, 3.4
<i>Road and rail transport is managed according to Industry Best Practice Management and customer needs</i>	3	Table 3.3, 3.4, 3.5
<i>Clean-down procedures of storage facilities and ancillary equipment following grain movement</i>	3, 14	Table 3.3, 3.4
<i>Storage operators have procedures to manage contractors</i>	3, 14	Table 3.3, 3.4

**Verification Methods**

There is not a specific or mandatory need to sample and test grain for the presence of GM material to ensure compliance to industry standards. The testing may occur as required by the customer or as determined by the receival site operator internal audit procedures to ensure compliance with specifications or tolerance levels set by the marketplace.

Appropriate analytical assessment processes are available to determine the GM content of the grain. Rapid tests are available for current GM canola events or more elaborate laboratory based tests are available.

Refer to Appendix 1 Technical Reference 3, 14 & 21 and Appendix 6 Stewardship Principles Tables 3.4 & 3.5 for further information.

## **3.6 Marketing & Exporting**

### **3.6.1 Marketing**

#### **Definition**

Marketing is the sale and delivery of grain or grain products to the domestic or export market.

#### **Rationale**

Crops are only released that are approved in markets from a regulatory and commercial trade viewpoint. Approval relates to the use of that crop or product for human or animal consumption, enabling the crop to be marketed to either the domestic or export market.

Relevant quality classification standards, descriptions, AP levels and supply chain protocols are established before the commercial release of a GM, non-GM or specialty crop. Industry processes are in place to develop AP levels in other crops as required.

Customer requirements must be known.

The marketing contract outlines the grade, description and all quality requirements of the commodity. Terms and conditions outlined in contracts comply with relevant regulations including OGTR requirements and Territory, State or Federal legislation for GM or other crops.

As per accepted industry practices, the marketer arranges delivery of the correct product. The marketer contract with the grain handler or other organisations in the supply chain outlines any specific requirements other than those outlined above.

Industry classifies the grain as non-GM as long as it complies with the relevant AP standards. Processes are designed to minimise AP to as close to zero as is economically, technically and operationally as possible.

Where specific samples or analytical results are required to be provided as per contract terms, the marketer arranges these with the relevant industry organisation. In this scenario, standard sampling and testing protocols apply.

Samples may be required in support of documentation.

Grain is labelled and accompanied by a declaration of its GM status and/or test results when required by the market.

For exports, grain is also labelled as per quarantine requirements of the importing country if relevant.

**Outcomes required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Customer requirements are known</i>	2, 3, 16	Table 3.4
<i>Market acceptance of grain</i>	2, 3, 16	Table 3.4
<i>Marketer contract with relevant participants in the supply chain</i>	3, 16	Table 3.1, 3.4
<i>Description and labelling of grain as per customer contract</i>	2, 3, 16	Table 3.4
<i>Documented regulatory and customer requirements for GM grains for the domestic market</i>	3, 16	Table 3.4
<i>Documented regulatory and customer requirements for GM grains for export markets</i>	2, 3, 16	Table 3.4
<i>Certification of grain as per customer contract</i>	2, 3, 16	Table 3.4

**Verification Methods**

Testing for the GM status or other quality attributes only occurs where the supply chain participants or marketers QA system, importing country quarantine requirements or customer contract stipulates. Declarations and processes employed through the supply chain suffice for most markets.

Appropriate analytical assessment processes are available to determine the GM content of the grain. Rapid tests are available for current GM canola events or more elaborate laboratory based tests are available.

Refer to Appendix 1 Technical Reference 2, 3, 16 & 21 and Appendix 6 Stewardship Principles Tables 3.4 for further information.

### 3.6.2 Exporting Grain

#### Definition

The commodity is loaded on board a vessel (ship) in bags, containers or in bulk. The vessel then transfers the grain to the importing country for unloading.

#### Rationale

Vessel operators comply with best practice guidelines for vessel hygiene to maintain the quality and integrity of the grain to be loaded and to prevent unintentional contamination.

Government and independent parties inspect empty vessels as per:

- AQIS regulations;
- Australian Maritime Safety Authority regulations, and
- Independent inspection companies as per their documented quality systems

When it is satisfactorily determined that there is no crop or any other residue present in the bags, containers or holds which may lead to unintended contamination or that may violate quarantine regulations, and that there is no risk of such from any other cargo (if present on board a vessel), approval to load is granted.

AQIS sample and inspect the grain during loading to ensure Australian and the importing country quarantine requirements are met.

The export facility operator is responsible for out-loading the correct grain type, quality and quantity. This is checked through documentation records and is underpinned by all processes applied from receipt point up country and any grain consolidation, through to the export position. Grain is physically sampled as it is loaded to ensure compliance with contract terms and conditions. Depending on market requirements, there may be a need for the export facility operator to clean the handling facilities and pathways or flush these with other grain. Internal procedures based on risk will determine the nature of the procedure required.

Storage operators ensure that their own staff and any contractors used comply with the storage operator's QA systems and procedures.

The export facility operator may sample the grain and inspect for quality or employ a contract operator. Samples may be retained for subsequent analysis or for dispute processes if required.

Where specific samples or analytical results are required to be provided as per contract terms, the marketer arranges these with the export facility operator. In this scenario, standard sampling and testing protocols apply.

Samples may be required in support of documentation.



Where there is a government requirement, AQIS will sample the grain at the export point or require test results or details of a documented Quality Assurance System to be provided by the exporter. Pre-clearance protocols are as per standard industry protocols.

Documentation is processed to ensure the correct grain is loaded and provided as evidence of the quality loaded to the exporter and vessel owner.

Processes along the supply chain during receipt, storage and transport have been implemented to identify and subsequently maintain the integrity of the commodity. AQIS have permitted loading to commence. The grain has not been unintentionally exposed to GM material. Thus, no testing for its GM status or AP levels on loading may be required unless stipulated by the market or by the internal QA systems of the export facility operator.

### Outcomes Required

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Bags, containers and/or vessel inspected, has passed survey and is deemed fit for loading</i>	3	Table 3.3, 3.4
<i>Export facility pathways are adequately clean to prevent unintended contamination of the cargo to be loaded</i>	3	Table 3.3, 3.4
<i>Grain is inspected during loading by AQIS and meets Australian and the importing country quarantine requirements</i>	2, 3	Table 3.4
<i>On loading the grain is physically inspected and sampled by the export facility operator. Samples may be retained for subsequent analysis</i>	3, 14	Table 3.3, 3.4
<i>Control of all stock loaded to preserve the integrity of each grade</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Relevant records are maintained</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Export facility operator has documented QA procedures</i>	3, 14	Table 3.4, 3.5
<i>Shipment transport units are described appropriately with the grade name and other relevant information</i>	3, 14	Table 3.3, 3.4
<i>Clean-down procedures of facilities and ancillary equipment following grain loading</i>	3, 14	Table 3.3, 3.4
<i>Export facility operators have procedures to manage contractors</i>	3, 14	Table 3.3, 3.4
<i>Documentation to the exporter and vessel owner</i>	2, 3, 14, 21	Table 3.3, 3.4, 3.5

**Verification Methods**

Testing for the GM status or AP level occurs where the supply chain participants or marketers QA system, importing country quarantine requirements or customer contract stipulates. Declarations and processes employed through the supply chain suffice for most markets.

Appropriate analytical assessment processes are available to determine the GM content of the grain. Rapid tests are available for current GM canola events or more elaborate laboratory based tests are available.

Sampling and testing for other quality attributes may occur during the loading process or following loading, as determined by the export facility operator or marketers QA system, importing country quarantine requirements or customer contract.

Refer to Appendix 1 Technical Reference 2, 3, & 21 and Appendix 6 Stewardship Principles Tables 3.3 & 3.4 for further information.

### **3.7 End-Product Manufacture**

This section contains processes required to be managed for all grains (3.7.1 & 3.7.4) and those specifically required to be managed for canola (3.7.2 & 3.7.3).

#### **3.7.1 Processing & Manufacturing**

##### **Definition**

This includes all human consumption, stockfeed and industrial processors of grain and grain related products. Whole grain or grain products are received and processed, manufactured or blended into relevant products suitable for sale for end-user purchase and consumption.

##### **Rationale**

Contract terms stipulate the quality and labelling of the commodity to be received from a storage operator. The processor is responsible for producing a product that then meets customer requirements.

During storage of the grain and then processing, internal QA systems are used to monitor quality and maintain integrity of the grain and product. Each organisation develops internal procedures based on their risk assessment of the product to be produced taking into consideration customer requirements. The FSANZ Food Standards Act, Food Standards Code and their "in-house" protocols dictate what processes and labelling applies. However, product is stored and segregated according to end market requirements stipulated in sales contracts.

Depending on the contract the processor may sample and test the product before, during processing or prior to outturn according to their internal procedures. Additional processes to reduce the risk of unintended AP, such as clean down of equipment or flushing of equipment may be required depending on the contract with the customer.

**Outcomes Required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Product received and produced for the customer is segregated to preserve the integrity where required</i>	3	Table 3.6
<i>Relevant records are maintained</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Processing and manufacturing facility operator has documented QA procedures</i>	3, 14	Table 3.4, 3.5
<i>Description and labelling of product as per customer contract and relevant legislation</i>	2, 3, 16, 17, 18	Table 3.4
<i>Clean-down procedures of facilities and ancillary equipment following processing</i>	3, 14	Table 3.3, 3.4
<i>Processing and manufacturing facility operator has procedures to manage contractors</i>	3, 14	Table 3.3, 3.4
<i>Documentation and certification as required to the customer</i>	2, 3, 14, 16, 17, 18	Table 3.3, 3.4, 3.5

**Verification Methods**

Testing for the GM status or AP level occurs where the processor or manufacturers' QA system or customer contract stipulates. Declarations and processes employed prior to receipt of the grain or product suffice for most customers.

Appropriate analytical assessment processes are available to determine the GM content of the grain or product. Rapid tests are available for current GM canola events or more elaborate laboratory based tests are available.

Refer to Appendix 1 Technical Reference 3, 17, 18 and Appendix 6 Stewardship Principles Tables 3.6 for further information.

### 3.7.2 Canola Processing

#### Definition

This is the production of oil and by-products from canola grain. Canola is received and processed (crushed) into relevant products suitable for end-user purchase and consumption.

The products of crushing are stored, packaged and outturned to customers.

#### Rationale

Contract terms stipulate the quality and labelling of the canola to be received from the supply chain (grower or storage operator). Documentation is provided with the canola so the crusher is aware of the identity and quality status of the canola received, thus quality testing may not occur.

The crusher is responsible for producing a product that meets customer requirements.

During storage of the canola and then processing, internal Quality Systems are used to monitor quality and maintain integrity of the grain and product. Each organisation develops internal procedures based on their risk assessment of the product to be produced. The FSANZ Food Standards Code, Food Standards Act and their internal protocols dictate what processes apply. However, product is stored and segregated according to end market requirements stipulated in sales contracts.

Depending on the contract the crusher may sample and test the product for a range of quality parameters before, during crushing or prior to outturn according to their internal procedures. Additional processes to reduce the risk of unintended AP, such as cleardown of equipment or flushing of equipment may be required depending on the contract with the customer.

Transport operators outturning product comply with the AOF Code of Practice for the Bulk Transport of Vegetable Oilseeds, Meals and Hulls by Road and Rail to maintain the quality and integrity of the product and prevent unintentional contamination. This involves inspection, cleaning and use of dedicated transport units as needed by the market.

**Outcomes Required**

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Grain and product is transported using the appropriate management practice such as the AOF Code of Practice for the Bulk Transport of Vegetable Oilseeds, Meals and Hulls by Road and Rail</i>	3, 21	Table 3.2, 3.3, 3.4, 3.5, 3.6
<i>Stock and inventory control of grain and product</i>	3	Table 3.3, 3.6
<i>Relevant records are maintained</i>	3	Table 3.3, 3.6
<i>Processing facility operator has documented QA procedures</i>	3, 14	Table 3.3, 3.4, 3.5
<i>Description and labelling of product as per customer contract and relevant legislation</i>	3, 17, 18	Table 3.4
<i>Contract terms exist e.g., as listed in the AOF Trading Standards</i>	3, 21	Table 3.4, 3.5, 3.6
<i>Clean-down procedures of facilities and ancillary equipment following processing</i>	3, 14	Table 3.3, 3.4
<i>Documentation and certification as required to the customer</i>	2, 3, 14, 17, 18	Table 3.3, 3.4, 3.5

**Verification Methods**

Certification may accompany the products resulting from canola crushing.

Testing may occur as required by the customer or as determined by the crusher facility operator to ensure compliance with specifications or tolerance levels.

Appropriate analytical assessment processes are available to determine the GM content of the grain or product. Rapid tests are available for current GM canola events or more elaborate laboratory based tests are available.

Refer to Appendix 1 Technical Reference 3 and Appendix 6 Stewardship Principles Tables 3.2 & 3.6 for further information.

### 3.7.3 Stockfeed Use of By-Products

#### Definition

This is the use of canola meal as a by-product from canola seed crushing by the stockfeed industry. Canola meal is used by a range of animal industries for stockfeed consumption.

#### Rationale

Contract terms stipulate the quality and labelling of the canola meal to be received from the crusher. Documentation is provided with the canola meal so the user is aware of the identity and quality status of the canola meal received.

The canola may be sampled and inspected on receipt. Samples may be retained.

The crusher is responsible for producing a product that meets their stockfeed customer requirements.

Best management practices are in place to assist transport operators to maintain the quality and integrity of the grain and prevent unintentional contamination. This involves inspection, cleaning and use of dedicated transport units as needed by the market.

Best management practices are in place to assist industry to meet customer requirements. Stockfeed manufacturers utilise FeedSafe as a national QA accreditation program. FeedSafe is based on a Code of Good Manufacturing Practice which defines raw material sourcing, receipt and use standards.

There is no legal requirement for labelling of material from a GM source.

#### Outcomes Required

Process	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Product is transported using the appropriate management practice such as the AOF Code of Practice for the Bulk Transport of Vegetable Oilseeds, Meals and Hulls by Road and Rail</i>	3, 21	Table 3.2, 3.3, 3.4, 3.5, 3.6
<i>Stock and inventory control of product</i>	3	Table 3.3, 3.6
<i>Product is segregated where required</i>	3	Table 3.3, 3.6
<i>Relevant records are maintained</i>	3	Table 3.3, 3.6
<i>Product is labelled</i>	3, 17, 18	Table 3.2, 3.3, 3.6
<i>Management systems are available</i>	3, 22	Table 3.3, 3.5, 3.6

**Verification Methods**

There is no requirement to test the canola meal for its GM status upon receipt however it may be, subject to market requirements.

Refer to Appendix 1 Technical Reference 3, 22 and Appendix 6 Stewardship Principles Table 3.6 for further information.



### 3.7.4 Packaging & Retailing

#### Definition

Obtaining processed, manufactured, blended or whole product and then packaging it. In many instances, the processor may also be the packager.

Packing and storing (warehousing) this product as required until out-turned to the marketplace and retail sale to the consumer.

#### Rationale

Contracts with marketers or retailers stipulate labelling and certification requirements for GM status of the product.

Product is transported as per industry guidelines for transport of goods. Product received from the processor is labelled and certified.

Each individual organisation has their “in-house” QA system and protocols to ensure processes are employed to segregate and maintain the quality according to market requirements.

Products are labelled and described according to FSANZ legislative guidelines in terms of GM status or other domestic or export requirements. Packaging occurs in distinct batches on the basis of market requirements. Requirements of the FSANZ Food Standards Act and Food Standards Code are met.

Routine monitoring of stock for a range of quality parameters occurs. Similarly the GM status as depicted on labels may need to be audited under the packager QA system to ensure compliance with legislation and labelling claims.

#### Outcomes Required

Process Outcomes	Reference Source	
	Technical (Appendix 1)	Stewardship (Appendix 6)
<i>Stock and inventory control of product</i>	3	Table 3.6
<i>Product is segregated where required</i>	3	Table 3.6
<i>Relevant records are maintained</i>	3	Table 3.6
<i>Product is labelled</i>	3, 17, 18	Table 3.6
<i>Management systems are documented for all practices such as storage, packaging, transport</i>	3	Table 3.5, 3.6

**Verification Methods**

Individual organisations may test product for retail sale. Testing may occur as required by the customer or as determined by the facility operator to ensure compliance with specifications or tolerance levels listed on the label.

Refer to Appendix 1 Technical Reference 3 and Appendix 6 Stewardship Principles Table 3.6 for further information.

### **3.8 Consumer**

Consumers are the end-users of whole grains, grain products and/or the by-products including food and fibre from grain-fed animals. They receive product information based on the label and/or contract and from various other sources. Products are labelled according to the relevant regulations and industry codes of practice.

Individual companies and organisations or 'buying-groups' may vary labels where legally permitted according to their own marketing decisions. The same applies with health awareness groups or industry bodies such as the Heart Foundation with the 'Heart Tick'.

Consumers rely on Government regulations to ensure food safety and compliance while providing them with freedom of choice through allowing different products to be available in the market place. Regulation of processes undertaken throughout the supply chain gives consumers confidence that the product delivered meets their expectations of quality and food safety.

## 4. Reference Material

### Appendix 1 Technical Reference Documents

Reference Number	Technical Reference
1	Best Practice Guidelines for Management of Adventitious Presence in Canola Varieties - Australian Seed Federation, June 2006
2	BioSafety Protocol Implications of the documentation regime – ABARE February 2006
3	Canola Industry Stewardship Principles - Gene Technology Grains Committee, 2003
4	Code of Practice for Use of Seed Treatments - Australian Seed Federation, 2005
5	National Code of Practice for Seed Labelling and Marketing - Australian Seed Federation, August 2005
6	Development of a protocol for accreditation of non-GM grain produced in a designated non-GM region - Australian Government Department of Agriculture, Fisheries and Forestry, 2005
7	Gap Analysis in relation to Quality Management for the Supply Chain Management of Genetically Modified products - Lovell, Jane; Clark, Allison; Jeffries, David for Australian Government Department of Agriculture, Fisheries and Forestry 2003
8	Gene Flow Study Implications for the release of genetically modified crops in Australia - Bureau of Resource Sciences 2002
9	Guidelines for Managing the Adventitious Presence of Admixture in the Production, Processing and Marketing of Canola Seed - Australian Seed Federation 2003
10	Legal liability of farmers growing crops - ACIPA for Australian Government Department of Agriculture, Fisheries and Forestry 2005
11	Review of Technologies for Detecting Genetically Modified Materials in Commodities and Food - Australian Government Analytical Laboratories produced for the Department of Agriculture, Fisheries and Forestry, 2002
12	Seed Certification Scheme - Australian Seeds Authority
13	Seed Testing Protocols for Adventitious Presence in Canola Sowing Seed - Australian Seed Federation, 2003
14	Segregating GM and non-GM Grain in the Australian Grain Storage System - CSIRO July 2004
15	Standard for Adventitious Presence of GM seed in Canola Sowing Seeds - Australian Seed Federation, 2003
16	Towards Coexistence: Management practices for agricultural production systems – Agrifood Awareness Australia February 2006
17	FSANZ Food Standards Act 1991
18	FSANZ Food Standards Code 1987
19	Gene Technology Act 2000 and its Regulations 2001

Reference Number	Technical Reference
20	Best Management Practice Guidelines for Sowing Seed, Australian Seed Federation
21	AOF Trading Standards 2007
22	FeedSafe, Stock Feed Manufacturers' Council of Australia, March 2003

**Appendix 2 General Reference Documents**

<b>General Reference</b>
Adventitious Presence in Canola Seed - Australian Seed Federation
Agricultural Biotechnology: Herbicide Tolerant Crops in Australia - Bureau of Resource Sciences 2003
Agricultural Biotechnology: potential for use in developing countries Report 03.17 – ABARE 2003
Biotechnology Strategy for Agriculture, Food and Fibre - Australian Government Department of Agriculture, Fisheries and Forestry, August 2003
Market Access Issues for GM products – Australian Bureau of Agricultural and Resource Economics 2003
Marketing Mechanisms to facilitate Co-existence of GM and non-GM crops - Benjamin Henry, William W. Wilson and Bruce L. Dahl, Department of Agribusiness and Applied Economics, Agricultural Experiment Station, North Dakota State University, Fargo, North Dakota, September 2006
Plant Breeder's Rights. Information Booklet No.2 ACIPA for Australian Government Department of Agriculture, Fisheries and Forestry 2005
Report on the implementation of national measures on the coexistence of genetically modified crops with conventional and organic farming – Commission of the European Communities March 2006
Thinking of growing GM crops - ACIPA for Australian Government Department of Agriculture, Fisheries and Forestry 2006
Tracking potential GM inputs to the stockfeed supply chain for feedlot beef: a discussion paper - C.F. Lamb and D.C. Cunningham, Bureau of Rural Sciences 2003
What's in the Pipeline? Genetically modified crops under development in Australia -Julie Glover, Osman Mewett, Michelle Tifan, David Cunningham, Kim Ritman and Ben Morrice, Bureau of Rural Sciences, 2005

### **Appendix 3 Terminology and Abbreviations Glossary**

#### **Adventitious Presence (AP)**

The unintended presence of genetic material or whole seeds from another variety, crop, or weed in seed or a grain product

#### **Biotechnology**

A broad term originally used to describe the application of biology in the creation of helpful products (for example, agriculture, brewing and baking were all considered types of biotechnology). Recently, the word has come to refer more to modern methods of using organisms and biological processes to create either genetically modified organisms or products (such as insulin and many pharmaceuticals) manufactured using the techniques of genetic engineering

#### **Cartagena Protocol on BioSafety**

An international protocol under the Convention on Biological Diversity that seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology (Australia has not ratified the Cartagena Protocol)

#### **Cereal**

Edible starchy grain yielded by certain plants of the grass family. Includes rice, corn, sorghum, rye, wheat, oats, barley and triticale

#### **Codex Alimentarius**

This is an international food code consisting of standards, codes of practice, guidelines and recommendations for producing and processing food. The Codex Alimentarius Commission administers it

#### **Coexistence**

In agriculture, this is the harmonious production of different cropping systems in the same environment or ecosystem to facilitate choice at any given point throughout the supply chain

#### **Conventional breeding**

The techniques of animal or plant breeding that have been carried out for thousands of years. Conventional breeding usually involves choosing the individual plants or animals, which possess the features closest to the desired ideal, and then breeding these individuals together. Conventional breeding is an approximate way of controlling gene combinations, and of ensuring that a gene or genes for a desirable trait are passed on or deliberately mixed with other desirable genes

#### **Deal**

As defined in the Gene Technology Act 2000, relating to research, manufacture, production, transport, destruction, commercial release and import of GMs

### **Definitive Testing Methods**

The three are:

- a) PCR
- b) Protein Testing (LFS, Elisa)
- c) Biological (spray tests)

### **Event**

An "event" in genetic engineering is the insertion of a particular piece of foreign DNA into the chromosome of the 'recipient'. Insertion occurs in random locations, so each event is unique. The event can affect how a gene is expressed in the organism. Once an event occurs, the transgene can be passed to the next generation as a normally inherited gene.

### **Gene**

This is a portion of DNA carrying instructions. Genes usually code for the production of a protein molecule, but some are the blueprint for the formation of other molecules. Some sections do not code for anything. Genes are said to be active or 'expressed' when they are being 'read' and used for the production of something

### **Gene technology (modification)**

The ability to manipulate, modify and transfer genes or segments of DNA

### **Genetic modification (GM)**

Genetic modification is a general term that can cover many processes which result in the deliberate changing of the genetic material in an organism. Scientists can determine whether or not the change will be passed onto offspring. In conventional breeding (see above) the modification is usually passed on. However, it is possible to modify genes and not have the modification passed on to offspring

### **Genetically Modified Organism (GMO)**

An organism that has genetic material that has been altered by a gene technology is called a GMO. In common usage, GMO is generally interpreted as meaning a 'transgenic' (see below) organism

### **Grains**

Includes barley, canola, chickpeas, corn, field peas, faba beans, linseed, linola, lupins, monola, mung beans, mustard, oats, rapeseed, rice, safflower, sorghum, soybeans, sunflower, triticale, wheat

### **Herbicide tolerant**

A plant that is tolerant of (specific) herbicides. Herbicide-tolerant crops were developed to survive certain herbicides that previously would have destroyed the crop along with the targeted weeds, and allow farmers to use them as post-emergent herbicides, providing effective weed control as alternatives to more toxic herbicides. The most common herbicide-tolerant crops (cotton, corn, soybeans, and canola) are Roundup Ready (RR) crops resistant to glyphosate, a herbicide effective on many species of grasses, broadleaf



weeds and sedges. Other genetically modified herbicide-tolerant crops include Liberty Link (LL) corn resistant to glufosinate-ammonium, and BXN cotton resistant to bromoxynil

**High Oleic**

High oleic canola oil is monounsaturated oil that is high in omega-9 fatty acids, a non-essential fat (for example skin glands produce omega-9 fatty acids). Oleic acid is a fairly stable molecule, and may help to keep arteries supple

**IMI-Tolerant canola**

This is a non-GM variety of canola available in Australia resistant to the herbicide, Imidazolinone. Herbicide tolerant crops are not harmed by the herbicides applied to the weeds around them, providing growers with greater flexibility in weed control options

**Legume**

Includes all leguminous plants, including pulse crops for grain as well as pastures such as alfalfa and clover and shrubs etc

**Living modified organism (LMO)**

This is a living organism that has a new combination of genetic material obtained through the use of modern biotechnology. The term is mostly used in connection with the Cartagena Protocol

**Non-GM Grain**

This is grain that contains less than 0.9% by adventitious presence of OGTR-approved GM grain (that is, grain from a transgenic crop)

**Non-GM Seed**

This is seed that contains less than 0.5% by adventitious presence of OGTR-approved GM seed (that is, seed from a transgenic crop)

**OGTR Approved Events**

Events approved for commercialisation under OGTR license from the Office of the Gene Technology Regulator (OGTR)

**OGTR Approved Research Events**

Events approved under OGTR license with restricted conditions

**Organic**

Any food, feed, fibre or fuel produced "naturally" without the use of pesticides, herbicides, fungicides or artificial fertilizers in order to meet applicable standards

**Oleic**

An unsaturated fatty acid found in a number of crops, including sunflower and maize associated with health benefits and stability characteristics

**PC2**

This is a Physical Containment Level 2 Laboratory Facility (PC2) which meets a range of specific requirements and is certified by the OGTR to conduct particular work with GMOs. The requirements for PC2 containment emphasise the procedures to be observed by a laboratory to ensure a basic level of laboratory safety. The work that can be conducted in a PC2 laboratory includes work with GMOs that present a low to moderate potential risk to people and/or the environment. It may include some work with plant tissue culture and some work with small animals, but must not include the housing of animals for lengthy periods or the growing of plants (except those in tissue culture or contained in a plant growth cabinet)

**PCR**

Polymerase Chain Reaction (PCR) is a technique, (used for example in DNA identification), in which one or more specific small regions of the DNA are copied using a DNA polymerase enzyme so that a sufficient amount of DNA is generated for analysis. The polymerase chain reaction technique is used to quickly amplify a particular piece of DNA *in vitro*, (rather than in living cells). Using this procedure, it is possible to make virtually unlimited copies of a single DNA molecule even though this molecule may be present in a mixture containing many other different DNA molecules

**Phytosanitary**

Pertaining to the health of plants. A Phytosanitary Certificate is a document issued by the exporting country's government to satisfy import regulations of the importing government, indicating that the shipment has been inspected and is free from harmful pests and plant diseases

**Pool**

A Grower Pool is a payment option where a grower elects not to receive full payment immediately for a certain type and quantity of grain delivered to a storage agent, but instead "pools" it with deliveries by other growers in the hope of gaining a better price per tonne at a future point in time

**Pulses**

Leguminous plants producing grains such as lentils, chickpeas, field peas, garden peas, mung beans, faba beans, narrow leaf lupins (*Lupinus angustifolius*), albus lupins, vetch, mutabilis lupins, Mediterranean lupins

**QA**

Quality assurance (QA) involves a planned and systematic pattern of all actions necessary to provide confidence that adequate technical requirements are established, that products and services conform to established technical requirements, and that satisfactory performance is achieved. QA depends on the adoption of minimum standards of control and monitoring. Formal systems are often developed on behalf of industry by a peak industry body or association and may be monitored by an independent entity

**Specialty Crop**

Are not considered mainstream crops and are any crop not considered conventional, required for a special purpose e.g., organic

**Stewardship Protocols**

In the context of grains, relates to the management of crops, generally following specific guidelines and protocols provided by the Technology Provider or seed supplier. May also be referred to as Technology User Agreements (TUAs)

**Supplier Contract**

This is a contract between the grower and the seed supplier or provider of the technology. It outlines various stipulations relating to the handling, growing marketing and/or use of the seed

**Traits**

Genetic traits are those aspects of an organism controlled by genes, for example eye colour in humans. Genetic traits are inherited. A novel trait in a plant exists when a plant possesses characteristics not normally found in that species where the new characteristic has been created through specific genetic manipulation, transformation, mutation, etc

**Transgenic**

This is an organism whose genome has been altered by the inclusion of additional genetic material. This genetic material may be derived from other individuals of the same species or from wholly different species. Genetic material may also be of an artificial nature. Genetic information can be added to the organism during its early development and incorporated in cells of the entire organism. As an example, transgenic organisms have been produced that provide enhanced agricultural and pharmaceutical products. These include bacteria containing the gene for human insulin and plants that contain the gene for a naturally occurring insecticide derived from a bacterium

**Unapproved Events**

Events not approved by any OGTR license

**Variety**

A group of organisms within a species, having similar characteristics but not distinct enough to be a separate species

**Sources and References Adapted from:**

CropLife International: [www.croplife.org](http://www.croplife.org).

CSIRO: [genetech.csiro.au/glossary.htm](http://genetech.csiro.au/glossary.htm)

Food & Drink Federation: [www.foodfuture.org.uk](http://www.foodfuture.org.uk)

GRDC (2003) Feeding Tomorrow's World. Biotechnology and the grain industry

Kansas State University <http://www.oznet.ksu.edu/biotech/glossary.htm#e>

## Appendix 4 Overview of Supply Chain for GM and Non-GM Grains

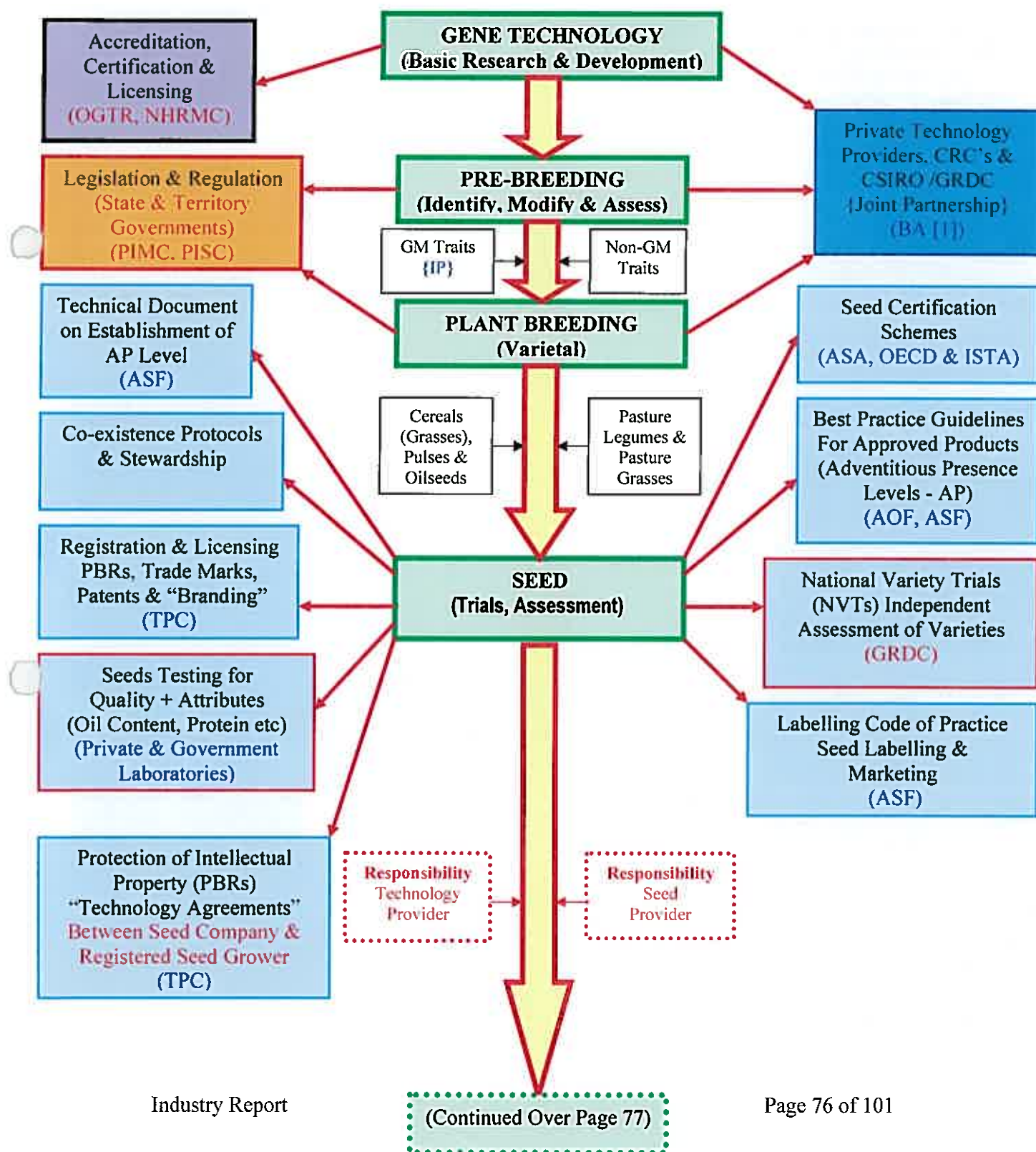
**In the following flow chart**

**Blue Print at the bottom of a box:**

Denotes industry body or government instrumentality providing legislation or guidelines (Codes of Practice, Best Practice Guidelines, Protocols, QA etc)

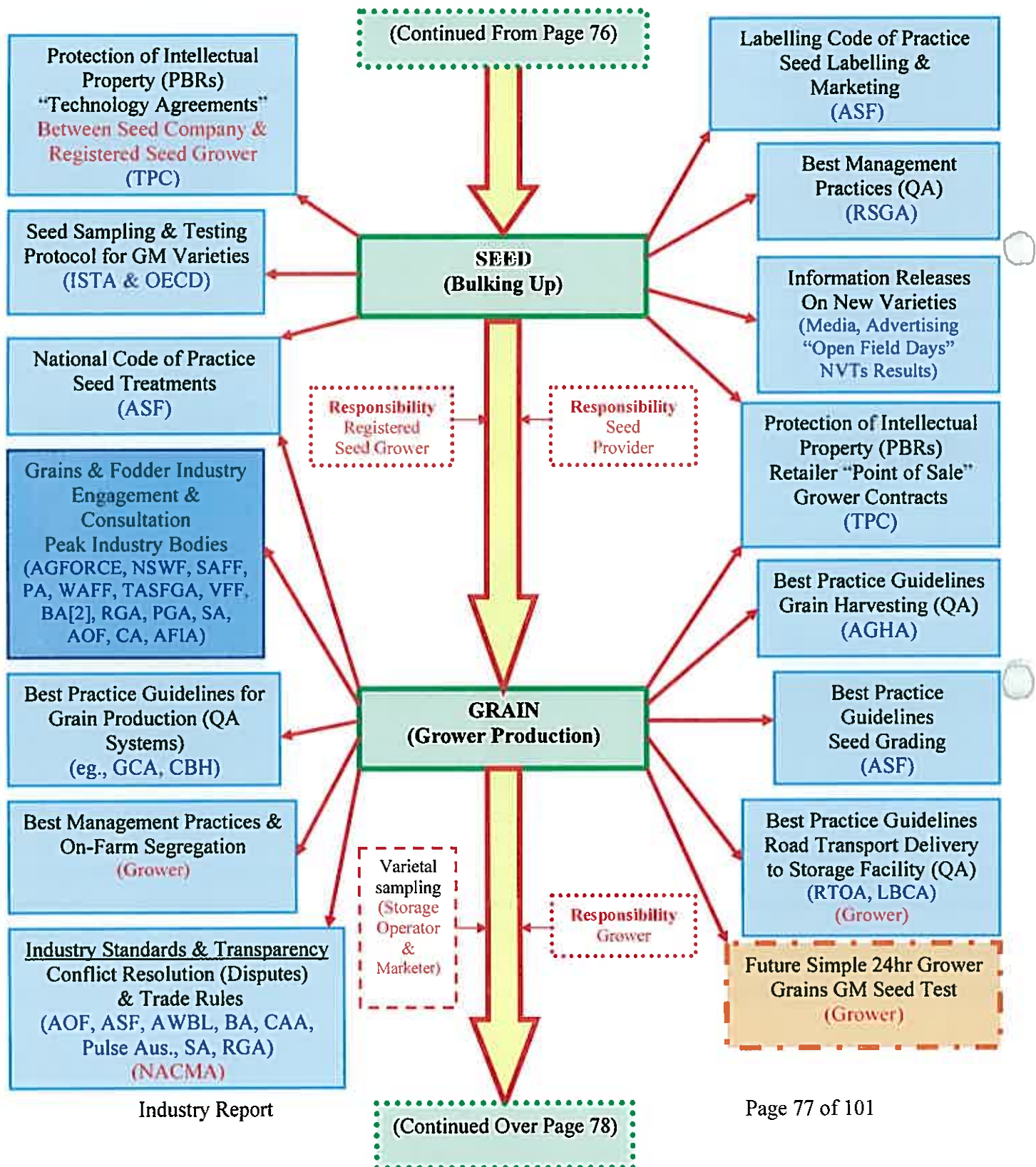
**Red Print within or at the bottom of the box:** Denotes who is responsible

## OVERVIEW OF THE SUPPLY CHAIN FOR GM AND NON-GM GRAINS



## Overview of the Supply Chain for GM and Non-GM Grains

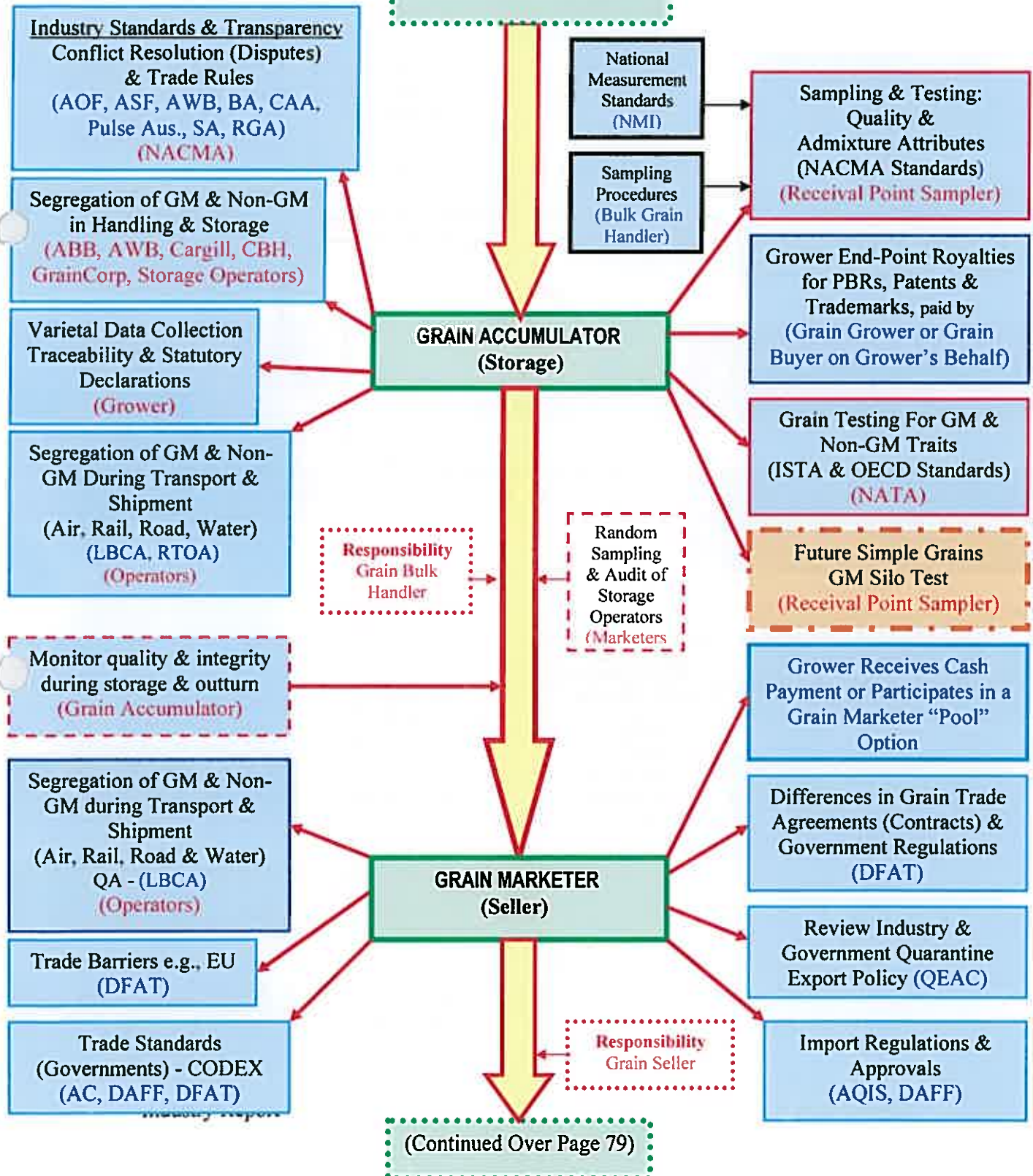
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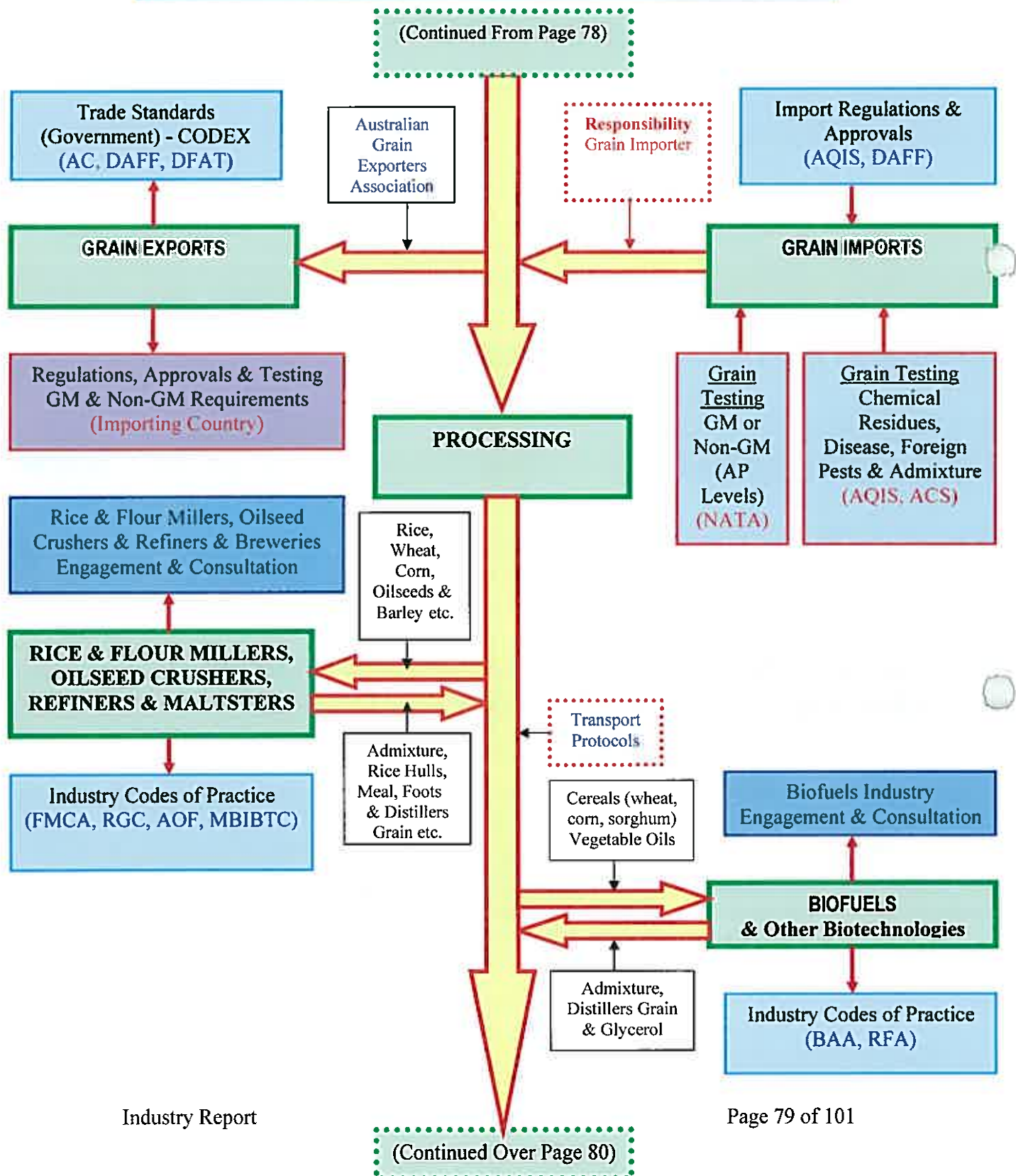


## Overview of the Supply Chain for GM and Non-GM Grains (Continued - Page 78)

(Continued From Page 77)



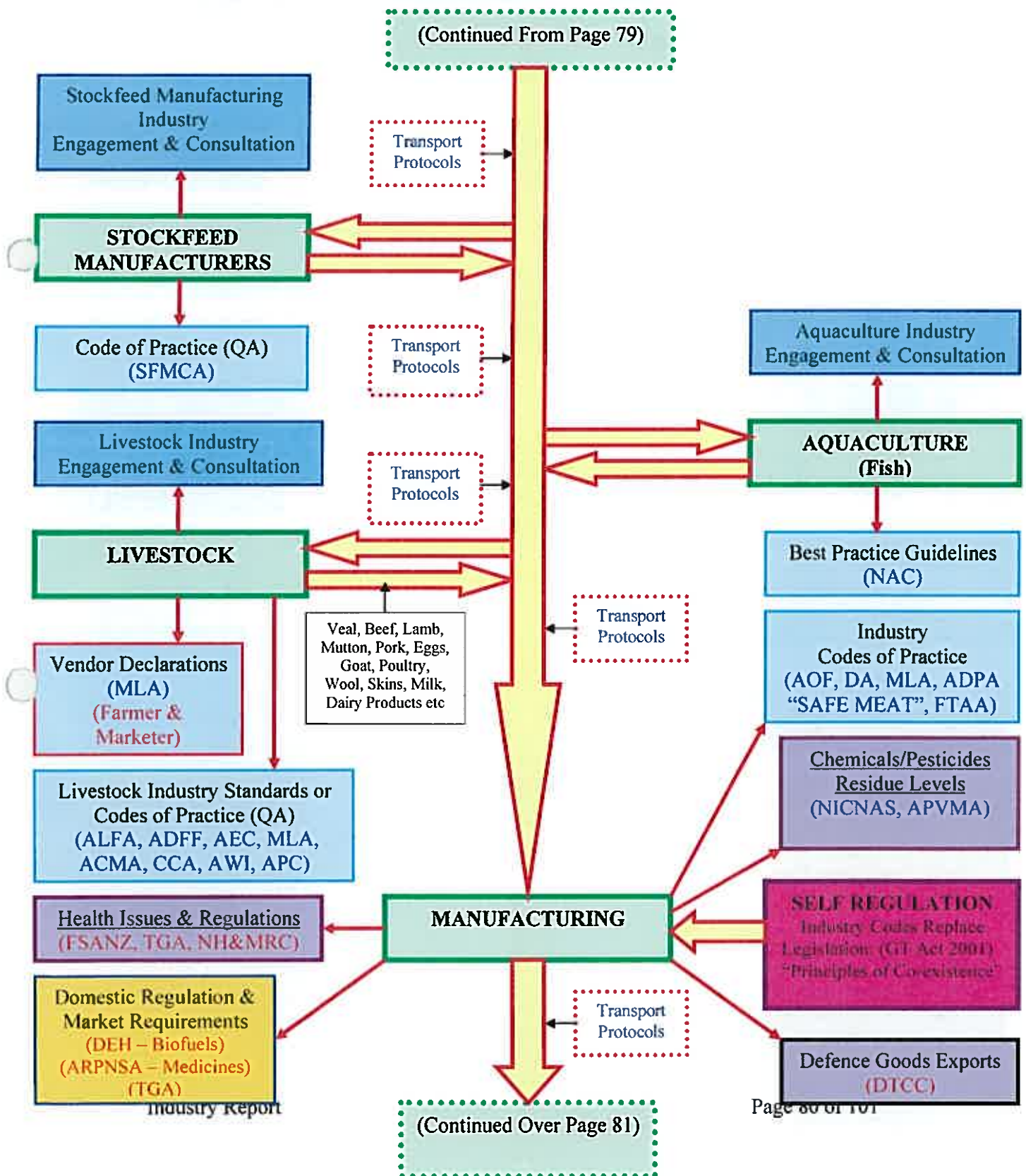
## Overview of the Supply Chain for GM and Non-GM Grains (Continued - Page 79)





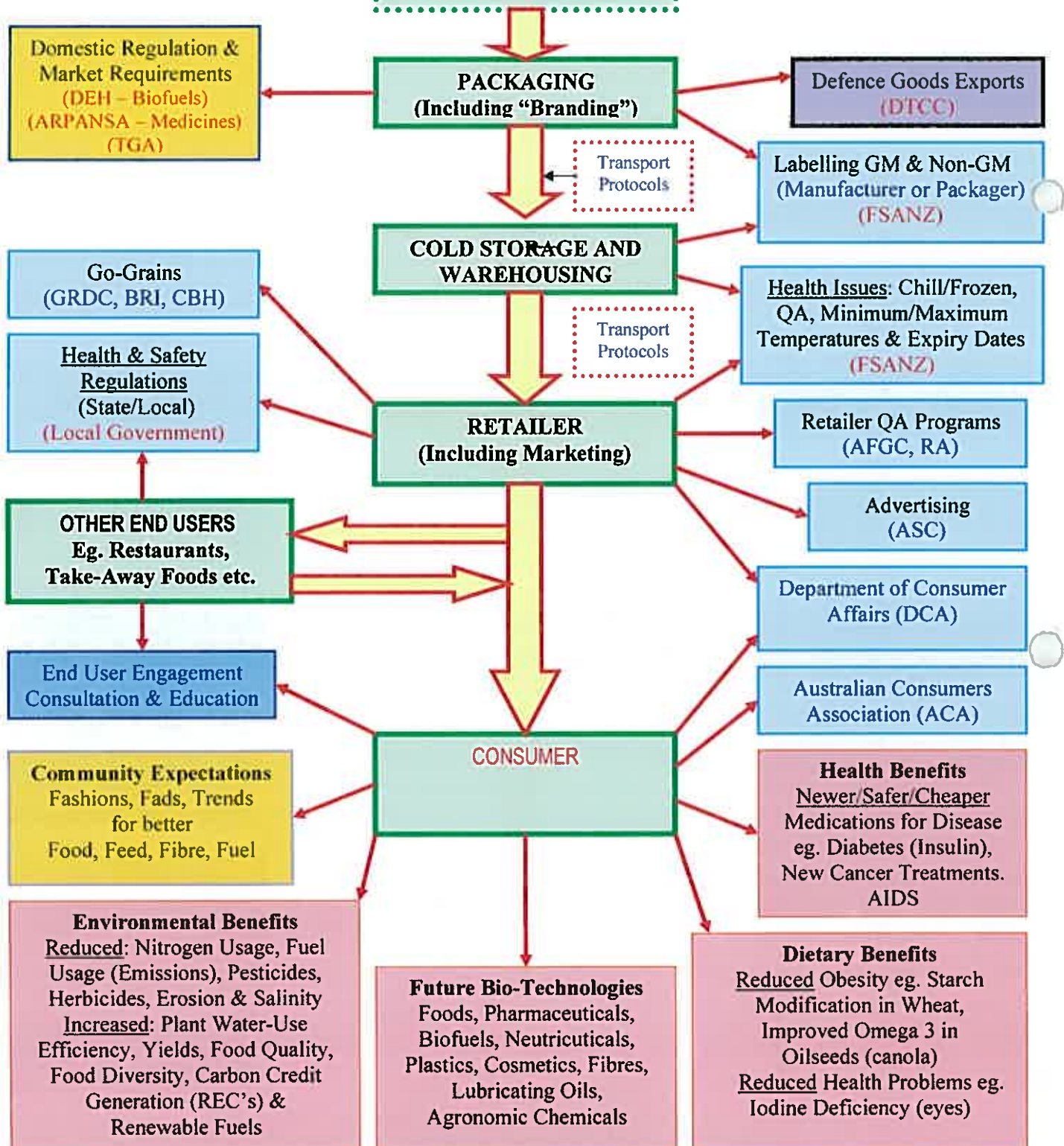
## Overview of the Supply Chain for GM and Non-GM Grains

(Continued - Page 80)



## Overview of the Supply Chain for GM and Non-GM Grains (Continued - Page 81)

(Continued From Page 80)



## Appendix 5            Grains Supply Chain Flow Chart

### Guide to Abbreviations, Industry Bodies and Government Agencies

ABB	- ABB Grain Limited
ACA	- Australian Consumers Association
ACS	- Australian Customs Service
AASC	- Australian Advertising Standards Council
ACMA	- Australian Chicken Meat Association
ADFF	- Australian Dairy Farmers Federation
ADPA	- Australian Dairy Products Association
AEC	- Australian Egg Corporation
AFIA	- Australian Fodder Industry Association
AFGC	- Australian Food and Grocery Council
AGEA	- Australian Grain Exporters Association
AgForce	- Queensland Farmers Organisation
AGHA	- Australian Grain Harvesters Association
ALFA	- Australian Lot Feeders Association
AMLC	- Australian Meat and Livestock Corporation
AOF	- Australian Oilseeds Federation
APC	- Australian Pork Council
AP	- Adventitious Presence (AP Levels)
APVMA	- Australian Pesticides and Veterinary Medicines Authority
ARPANSA	- Australian Radiation Protection and Nuclear Safety Agency
ASA	- Australian Seeds Authority
ASF	- Australian Seed Federation
AWB	- AWB Limited
AWI	- Australian Wool International
AQIS	- Australian Quarantine and Inspection Service (part of DAFF)
BA [1]	- Biotechnology Australia
BA [2]	- Barley Australia
BAA	- Biodiesel Association of Australia
Better Farm IQ (WA)	- QA program produced by CBH
BRI	- BRI Australia Ltd
CAA	- Canola Association of Australia
Cargill	- Grain Accumulator and Oilseed Processor
CBH	- Co-operative Bulk Handling (WA)
CCA	- Cattle Council of Australia
CHA	- Contract Harvesters Association
CODEX	Alimentarius Commission – Defines technical conditions on Overseas Trade
	Rules on issues such as      Grain Fumigants
	Foreign Materials
	Chemical residues
	Biotechnology
DA	- Dairy Australia
DAFF	- Department of Agriculture, Fisheries and Forestry (Federal)
DCA	- Department of Consumer Affairs (Federal)

## **Appendix 5            Grains Supply Chain Flow Chart**

### **Guide to Abbreviations, Industry Bodies and Government Agencies (cont)**

DTCC	- Defence Trade Control and Compliance
DEH	- Department of Environment and Heritage (Federal)
DFAT	- Department of Foreign Affairs and Trade (Federal)
FTAA	- Federated Tanners Association of Australia
FMCA	- Flour Millers Council of Australia
FSANZ	- Food Standards Australia New Zealand
GCA	- Grains Council of Australia
GGHN	- Go Grains Health and Nutrition Ltd
Graincare	- QA program produced by GCA
GrainCorp	- GrainCorp Operations Limited
GT Act	- Gene Technology Act 2000
GTCCC	- Gene Technology Community Consultative Committee (part of OGTR)
GTTAC	- Gene Technology Technical Advisory Committee (part of OGTR)
IP	- Identity Preservation
ISTA	- International Seed Testing Association
LFGUG	- Livestock Feed Grain Users Group
LBCA	- Livestock and Bulk Carriers Association
MBIBTC	- Malting and Brewing Industry Barley Technical Committee
MLA	- Meat and Livestock Australia
NACMA	- National Agricultural Commodities Marketing Association
NATA	- National Association of Testing Authorities
NAC	- National Aquaculture Council
NH&MRC	- National Health and Medical Research Council
NICNAS	- National Industrial Chemicals Notification and Assessment Scheme
NMI	- National Measurement Institute – Part of Department of Industry, Tourism and Resources
NSWF	- New South Wales Farmers (Association)
OECD	- Organisation for Economic Cooperation and Development
OGTR	- Office of the Gene Technology Regulator
PA	- Pulse Australia
PBR	- Plant Breeders Rights (Registration and Licensing)
PGA	- Pastoralists and Graziers Association (WA)
PIMC	- Primary Industries Ministerial
PISC	- Primary Industries Standing Committee
PTM	- Pathway to Market
QA	- Quality Assurance (a Code of Practice)
QEAC	- Quarantine Export Advisory Council (part of DAFF)
RFA	- Renewable Fuels Association
RA	- Retailers Association
RGA	- Rice Growers Association
RGC	- Rice Growers Co-operative

**Appendix 5            Grains Supply Chain Flow Chart**  
**Guide to Abbreviations, Industry Bodies and Government Agencies (cont)**

RSGA	- Registered Seed Growers Association
RTOA	- Road Transport Operators Association
SA	- Sorghum Association
SAFE MEAT	- Industry Body of Meat Processors
SAFF	- South Australian Farmers Federation
SFMC	- Stock Feed Manufacturing Council
SVGA	- Single Vision Grains Australia
TASFGA	- Tasmanian Farmers and Graziers Association
TGA	- Therapeutic Goods Administration
TPC	- Trade Practices Commission
VFF	- Victorian Farmers Federation
WAFF	- Western Australian Farmers Federation

**REFERENCES**

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USA, 1969

Regulation Matrix, Australian Biotechnology, BioRegs Online  
[www.bioregs.gov.au](http://www.bioregs.gov.au)

## **Appendix 6 Stewardship Principles**

### **Introduction**

This section provides individual industry organisations with a set of practical stewardship principles that define the different production processes that ensure different production systems and supply chains coexist. They are designed to provide verification references to industry organisations, allowing those who follow them to be able to meet their contractual and legislative requirements.

The stewardship principles:

- define the outcome required: that is, the end product that will move from one step of the supply chain to the next step in the supply chain;
- define the responsibility to act: that is, who takes responsibility for implementing the management practices and process verification for providing the product;
- provide an established reference or standard for management practices;
- define the relevant documentation that, if required, will track the provision and process verification of the end product through the supply chain, and
- define the process elements that, when properly managed, will produce the end product that meets predetermined market specifications.

Monitoring and traceability throughout the supply chain will rely on each supply chain participant creating and maintaining good records. Records will need to be sufficient to allow verification of processes and provide evidence of completion of activities. Disciplined record keeping at every stage of the supply chain is integral to the integrity of the whole system of coexistence.

### **Summary of Responsibilities for Process Verification**

The following Table summarises where identified risk points may occur within the supply chain, who is responsible for process verification and risk verification points, and the documentation required.



## Summary of Responsibilities for Process Verification

Supply chain	Process risk	Impact	Responsibility to act	Process verification point	Documentation	Process contract
Pre-farm	Approved GM event	GM	Tech provider	Pre breeding program	QA protocol	Technology licence (OGTR)
	Planting seed purity	Non-GM/GM	Seed company	In crop	QA protocol	Seed production contract
				Pre-processing		
	Misidentification	Non-GM/GM	Seed company	Despatch to distributor	Seed bag label	Seed processing contract
Seed distributor				Seed bag batch number	Seed marketing contract	
On-farm	Hygiene – farmer equipment	Non-GM/GM	Farmer	N/A	Grower records	N/A
	Hygiene – contractor equipment		Contractor			Farmer-contractor agreement
	Herbicide management	GM	Farmer/tech provider	Pre- and post-crop		
	Adventitious presence of off-types	GM	Farmer/tech provider			
	Adventitious presence of off-types in adjacent crops	Non-GM	Farmer *	In crop	Grower records	
	Adventitious presence of volunteers	GM	Farmer/tech provider	Post crop		
	Adventitious presence of volunteers in adjacent crops	Non-GM	Farmer *			
	Misidentification (farmer-saved seed)	Non-GM/GM	Farmer/tech provider	Pre-planting	QA records	Technology User Agreement – Crop Management Plan
	Misidentification	Non-GM/GM	Farmer/tech provider	Receival point		
	Hygiene	Non-GM	Farmer	Slack sample		
	Storage	Segregation systems	Non-GM	Farmer	Out-turn	Internal records and procedures
Hygiene		Non-GM	Farmer/contractor	N/A		
Environmental – adventitious presence						

## Summary of Responsibilities for Process Verification (continued)

Supply chain	Process risk	Impact	Responsibility to act	Process verification point	Documentation	Process contract
<b>Post-farm</b>						
Storage	Grower non declaration or misidentification	Non-GM/GM	Farmer	Grain Receiptal	Grain delivery declaration	Grain supply contract
	Misidentification			Receiptal point		
	Hygiene	Non-GM	Operator	Stack sample	QA records	Marketer/BHC storage and handling agreement
	Segregation systems			Out-turn		
Transport	Hygiene	Non-GM			Internal records and procedures	
	Environmental – adventitious presence	Non-GM/GM	Transport operator	N/A		Freight agreement
Processing	Adventitious presence (co-mingling)	Non-GM	BHC			Marketer/BHC storage and handling agreement
	Hygiene	Non-GM	Processor	Out-turn	Internal procedures and processing records	End user/processor contract
	Segregation systems				Test result	
	Adventitious presence (co-mingling)	Non-GM	Crusher	Out-turn crusher	Test certificates	End user/processor contract
Domestic end user	Adventitious presence (co-mingling)	Non-GM	BHC	Out-turn BHC	BHC internal records	Marketer/BHC storage and handling agreement
Exporter	Adventitious presence (co-mingling)	Non-GM			AQIS certification	

OGTR = Office of Gene Technology Regulator; QA = quality assurance; N/A = not applicable; GM = genetically modified; BHC = Bulk handling company; AQIS = Australian Quarantine and Inspection Service \* only if the GM/non-GM border is along the fence



## Details of Responsibilities for Process Verification

<b>Table 1.1 Gene Technology Research</b> (refer 3.1.1, 3.2.1, 3.2.2)		
<b>Outcome required: 1. Germplasm seed supply 2. Breeders seed supply</b>		
<b>Responsibility to act: (a) Breeder (b) Technology Provider</b>		
Process to Manage	Process Documentation	Process Reference
<ul style="list-style-type: none"> <li>genetic purity</li> <li>event</li> </ul>	Breeder per OGTR licence	Breeder's requirements OGTR licence requirements
<ul style="list-style-type: none"> <li>genetic purity</li> <li>event</li> </ul>	Breeder per OGTR requirements	Breeder's requirements
<ul style="list-style-type: none"> <li>maintenance of supply</li> </ul>		Plant Breeder's Rights Act, Patents Act
<ul style="list-style-type: none"> <li>cultivar description and intellectual property rights</li> </ul>	Per Plant Breeder's Rights Office, Patents Office requirements	

<b>Table 1.2 Seed Production</b> (refer 3.2.1, 3.2.2, 3.2.3, 3.2.4)		
<b>Outcome required: Production of genetic quality assured and/or certified seed</b>		
<b>Responsibility to act: (a) Seed Quality Management (b) Service Provider</b>		
Process to Manage	Process Documentation	Process Reference
<b>Breeder's seed</b> <ul style="list-style-type: none"> <li>breeder's seed origin</li> <li>cultivar description</li> <li>intellectual property rights (PBR or patent)</li> <li>owner permission to multiply</li> <li>notification of permitted generations and harvests</li> </ul>	Certification or other seed quality label Retention of a sample of original breeder's seed and final seed product	OECD/AOSCA Australian domestic seed quality management schemes Crop management plans of Technology Provider
<b>Seed production area</b> <ul style="list-style-type: none"> <li>location</li> <li>field history</li> <li>crop management plans</li> <li>pre-sowing machinery inspection for cleanliness</li> <li>identity of sowing seed (lot number)</li> <li>isolation from potential weedy or crop contaminants</li> </ul>	Compliance reports of activities undertaken Farmer records	Technology user agreement or seed production contract  OECD isolation requirements

<b>Table 1.2 Seed Production</b> (refer 3.2.1, 3.2.2, 3.2.3, 3.2.4)		
<b>Outcome required: Production of genetic quality assured and/or certified seed</b>		
<b>Responsibility to act: (a) Seed Quality Management (b) Service Provider</b>		
<b>Process to Manage</b>	<b>Process Documentation</b>	<b>Process Reference</b>
<b>Field inspection</b> <ul style="list-style-type: none"> <li>• pre-sowing</li> <li>• isolation from genetic contamination (weedy species and neighbouring crops)</li> <li>• plant-pest status</li> <li>• flowering of crop</li> <li>• compliance of cultivar to description</li> <li>• varietal purity assessment</li> </ul> <b>Harvest</b> <ul style="list-style-type: none"> <li>• pre-harvest machinery inspection (windrower, header and other ancillary handling equipment) for cleanliness</li> <li>• inspection of seed storage and transport containers for cleanliness</li> <li>• identity tags for harvested seed</li> <li>• grower's declaration</li> </ul>		

<b>Table 1.3 Seed Processing / Packaging / Treatment / Labelling / Storage</b> (refer 3.2.1, 3.2.2, 3.2.3, 3.2.4)		
<b>Outcome required: Ensure appropriate processing, chemical treatment, packaging, labelling and storage of genetic quality assured seed</b>		
<b>Responsibility to act: Accredited/authorised seed processor (accredited to Seed Quality Management and Service provider or authorised by owner)</b>		
<b>Process to Manage</b>	<b>Process Documentation</b>	<b>Process Reference</b>
<b>Seed receipt</b> <ul style="list-style-type: none"> <li>• identity of seed lot</li> <li>• inward quantity</li> <li>• pre-processing storage container cleanliness</li> <li>• seed and inert matter moisture</li> </ul> <b>Processing</b> <ul style="list-style-type: none"> <li>• machinery cleanliness (may require inspection for high pedigree grades by Seed Quality Management service provider)</li> <li>• records of processing activity</li> <li>• clean seed quantity</li> </ul> <b>Seed treatment</b> <ul style="list-style-type: none"> <li>• chemical use records</li> <li>• treatment rate records</li> <li>• seed package labelling</li> </ul>	Certification or other seed quality label Seed receipt, pre-processing, processing, treatment, labelling and storage records Retention of labelled pre- and post-processing seed sample OGTR licence	OECD/AOSCA Australian domestic seed quality management schemes ASF Codes of Practice ISTA procedures

<b>Table 1.3 Seed Processing / Packaging / Treatment / Labelling / Storage</b> (refer 3.2.1, 3.2.2, 3.2.3, 3.2.4)		
<b>Outcome required:</b> Ensure appropriate processing, chemical treatment, packaging, labelling and storage of genetic quality assured seed		
<b>Responsibility to act:</b> Accredited/authorised seed processor (accredited to Seed Quality Management and Service provider or authorised by owner)		
Process to Manage	Process Documentation	Process Reference
<b>Packaging</b> <ul style="list-style-type: none"> <li>• container type (bulk or bags)</li> <li>• seed identification</li> <li>• label type (supplied by Seed Quality Management service provider or owner)</li> <li>• line number</li> <li>• species/cultivar</li> <li>• net seed weight</li> <li>• documentation of label use</li> </ul> <b>Storage</b> <ul style="list-style-type: none"> <li>• storage technology</li> <li>• warehouse conditions</li> <li>• environment control</li> <li>• sanitation</li> <li>• inventory control</li> </ul>		

<b>Table 1.4 Seed Testing</b> (refer 3.1.1, 3.2.1, 3.2.2, 3.2.3, 3.2.4)		
<b>Outcome required:</b> Traceability on genetic purity and physical quality of seed		
<b>Responsibility to act:</b> (a) Accredited sampler (accredited to accredited/authorised seed testing laboratory) (b) Accredited/authorised laboratory (accredited to seed quality management service provider or product owner) (c) Seed quality management service provider		
Process to Manage	Process Documentation	Process Reference
<b>Sampling (a)</b> <ul style="list-style-type: none"> <li>• seed lot size</li> <li>• procedure</li> <li>• sample size</li> <li>• sample labelling and sealing</li> </ul>	Per ISTA/AOSA standard	ISTA/AOSA
<b>Physical quality testing (b)</b> <ul style="list-style-type: none"> <li>• sub-sampling procedure</li> <li>• germination and physical purity analysis procedure</li> <li>• issue of certificate of analysis</li> </ul>	Per ISTA/AOSA standard	ISTA/AOSA
<b>Genetic purity testing (c)</b> <ul style="list-style-type: none"> <li>• sampling procedure</li> <li>• genetic trait purity testing procedure</li> <li>• issue of document of certification/quality</li> </ul>	Per OECD/AOSCA standard Technology provider or authorised quality management scheme standard	OECD/AOSCA, technology provider, other quality management schemes

Table 1.5      Seed Marketing (refer 3.2.3, 3.2.4, 3.3.1)		
Outcome required: Product identity preservation		
Responsibility to act: Seed merchant		
Process to Manage	Process Documentation	Process Reference
<b>Storage</b> <ul style="list-style-type: none"> <li>• warehouse environmental conditions</li> <li>• non-contamination of product</li> <li>• sanitation</li> <li>• maintenance of integrity of seed containers (seals and labels)</li> <li>• inventory control (seed lot integrity)</li> <li>• stock reconciliation and records</li> <li>• staff training</li> </ul> <b>Transport</b> <ul style="list-style-type: none"> <li>• secure, contamination-proof transport</li> <li>• transport hygiene between seed deliveries</li> <li>• stock reconciliation and records</li> </ul>	Certification/quality label or label supplied or authorised by technology provider Seed test certificates Processor warehouse warrants OGTR licence Transport cartage notes Seed sales invoices showing batch numbers	ASF Code of Practice for Seed Labelling and Marketing

<b>Table 2.1 Grain Production</b> (refer 3.3.1, 3.3.2, 3.3.3, 3.3.4)		
<b>Outcome required: Production and delivery of quality grain that meets customer standards</b>		
<b>Responsibility to act: (a) Farmer (b) In-field service provider</b>		
<b>Process to Manage</b>	<b>Process Documentation</b>	<b>Process Reference</b>
<b>Planting seed</b> <ul style="list-style-type: none"> <li>seed origin and quality</li> <li>crop cultivar/variety description</li> <li>identity of sowing seed (lot number)</li> <li>regulatory responsibilities (APVMA/OGTR where required)</li> <li>technology provider terms and conditions for use</li> <li>seed treatments as required</li> </ul> <b>Crop production area</b> <ul style="list-style-type: none"> <li>location</li> <li>field history <ul style="list-style-type: none"> <li>crop rotation/previous crop</li> <li>herbicide use</li> <li>fertiliser</li> </ul> </li> <li>pre-sowing machinery inspection for cleanliness</li> <li>field identification</li> <li>identification of neighbouring crops</li> </ul> <b>Field inspection</b> <ul style="list-style-type: none"> <li><b>Pre-sowing</b> <ul style="list-style-type: none"> <li>weedy species identification and control</li> </ul> </li> <li><b>In-crop</b> <ul style="list-style-type: none"> <li>weedy species identification and control</li> <li>insect and disease identification and control</li> </ul> </li> <li><b>Pre-harvest</b> <ul style="list-style-type: none"> <li>where required, the establishment between two neighbouring crops of a fence line buffer</li> </ul> </li> <li><b>Post-harvest</b> <ul style="list-style-type: none"> <li>weedy species and volunteer plant identification and control</li> </ul> </li> </ul> <b>Harvest</b> <ul style="list-style-type: none"> <li>pre-harvest machinery inspection for cleanliness (including contractors)</li> <li>optimum time to windrow to maximise yield and grain quality</li> <li>clean, secure, leak-proof grain transport, (including contractors)</li> <li>on-farm grain storage container inspection for cleanliness</li> <li>identity tags for harvested grain</li> <li>post harvest machinery clean down and inspection for cleanliness</li> </ul>	Farm procedures and records Technology User Agreement	<b>ASF Code of Practice</b> Labelling of Seed  <b>QA Systems</b> Field Selection and Preparation Crop Management Harvesting and Harvest Equipment Delivery Quality Customer Quality  <b>Commodity specifications</b> NACMA Standards  <b>Best practice manuals</b> Technology provider technical manuals

<b>Table 2.2 Grain Transport / Delivery / Storage</b> (refer 3.2.3, 3.3.4)		
<b>Outcome required: Ensure appropriate transport, delivery, labelling and storage of quality grain</b>		
<b>Responsibility to act: (a) Farmer (b) Contract transport operator</b>		
<b>Process to Manage</b>	<b>Process Documentation</b>	<b>Process Reference</b>
<b>Grain transport (on- and off-farm)</b> <ul style="list-style-type: none"> <li>• secure leak-proof transport</li> <li>• transport hygiene between crops</li> </ul>	Farm procedures and records Certification label Grower declaration	Bulk Transport of Grains  Commodity Specifications
<b>Grain receipt</b> <ul style="list-style-type: none"> <li>• identity of grain – grower declaration</li> <li>• identity of co-mingled grain – grower declaration</li> <li>• inward quantity</li> </ul>	Grain contract Delivery docket Certificate of Cleanliness of transport vehicle OGTR licence	QA Systems – On-farm Storage – Delivery Quality – Off-farm Transport
<b>Grain storage</b> <ul style="list-style-type: none"> <li>• clean, secure, leak- and vermin-proof storage before grain delivery</li> <li>• label and identity of storage contents</li> <li>• fumigate storage, as required</li> <li>• weedy species and volunteer crop identification and control</li> </ul>		
<b>Staff training</b> <ul style="list-style-type: none"> <li>• staff and contractors are trained, instructed and supervised, as required</li> </ul>		

<b>Table 2.3 Farmer-saved Planting Seed</b> (refer 3.3.1, 3.3.2, 3.3.3, 3.3.4)		
<b>Outcome required: Production of quality seed for planting a following crop*</b>		
<b>Responsibility to act: (a) Farmer (b) In-field service provider</b>		
<b>Process to Manage</b>	<b>Process Documentation</b>	<b>Process Reference</b>
<b>Planting seed</b> <ul style="list-style-type: none"> <li>• seed origin</li> <li>• cultivar description</li> <li>• identity of sowing seed (lot number)</li> <li>• regulatory responsibilities (APVMA/OGTR)</li> <li>• technology provider terms and conditions for use</li> <li>• seed treatments as required</li> </ul> <b>Seed status</b> Growers need to identify the GM status seed whether certifies or saved seed and the market defined quality standard for which they intend to produce.	Farmer records Technology user agreement Certificate of analysis OGTR licence where applicable	Technology provider technical manuals
<b>Seed production area</b> <ul style="list-style-type: none"> <li>• location</li> <li>• field history – rotation</li> <li>• pre-sowing machinery inspection for cleanliness</li> <li>• field identification</li> <li>• identification of neighbouring crops</li> </ul>		

<b>Table 2.3 Farmer-saved Planting Seed</b> (refer 3.3.1, 3.3.2, 3.3.3, 3.3.4)		
<b>Outcome required: Production of quality seed for planting a following crop*</b>		
<b>Responsibility to act: (a) Farmer (b) In-field service provider</b>		
<b>Process to Manage</b>	<b>Process Documentation</b>	<b>Process Reference</b>
<b>Field Inspection</b> <ul style="list-style-type: none"> <li>• pre-sowing               <ul style="list-style-type: none"> <li>– weedy species identification and control</li> </ul> </li> <li>• in-crop               <ul style="list-style-type: none"> <li>– weedy species identification and control</li> <li>– insect and disease identification and control</li> </ul> </li> <li>• pre-harvest               <ul style="list-style-type: none"> <li>– removal of weedy 'off-types'</li> </ul> </li> </ul> <b>Harvest</b> <ul style="list-style-type: none"> <li>• pre-harvest machinery inspection for cleanliness</li> <li>• inspection of farmer saved planting seed storage containers for cleanliness</li> <li>• identity tags for harvested planting seed</li> <li>• post harvest machinery clean down and inspection for cleanliness</li> </ul> <b>Post-harvest</b> <ul style="list-style-type: none"> <li>• weedy species and volunteer crop               <ul style="list-style-type: none"> <li>– identification and control</li> </ul> </li> </ul> <b>Seed storage</b> <ul style="list-style-type: none"> <li>• label and identity of storage contents</li> <li>• secure leak- and vermin-proof storage before seed delivery</li> <li>• fumigated storage, as required</li> <li>• weedy species and volunteer crop               <ul style="list-style-type: none"> <li>– identification and control</li> </ul> </li> </ul> <b>Genetic quality testing</b> <ul style="list-style-type: none"> <li>• sampling procedure</li> <li>• genetic purity testing procedure</li> <li>• issue of documentation of quality</li> <li>• farmers need to identify what they are starting with if they are going to produce to a market-defined quality standard</li> </ul> <b>Seed processing/treatment</b> <ul style="list-style-type: none"> <li>• machinery cleanliness</li> <li>• records of processing activity</li> <li>• clean seed quality and identity</li> <li>• records of chemicals used and treatment rate</li> </ul> <b>Physical quality testing</b> <ul style="list-style-type: none"> <li>• sub-sampling procedure</li> <li>• germination and physical purity analysis</li> </ul>		



<b>Table 2.4      Herbicide Resistance Management Plan</b> <i>(refer 3.3.1, 3.3.2, 3.3.3)</i>		
<b>Outcome required: Reduce the likelihood of herbicide resistance developing in weeds</b>		
<b>Responsibility to act: (a) Farmer (b) In-field service provider</b>		
<b>Process to Manage</b>	<b>Process Documentation</b>	<b>Process Reference</b>
<p><b>Principles</b></p> <ul style="list-style-type: none"> <li>• use of as many different weed control options (chemical and cultural) as possible, through all phases of crop rotation</li> <li>• entry to crop phase of a rotation with as low a weed burden as possible</li> <li>• every herbicide application counting – use registered rates that control weeds</li> <li>• herbicide rotation with different modes of action throughout crop rotation</li> </ul> <p><b>Weed population</b></p> <ul style="list-style-type: none"> <li>• identity of weed population spectrum and density in year before planting crop</li> <li>• testing of weed population herbicide resistance status, if required</li> <li>• implementing weed management strategies to reduce weed population during the whole rotation</li> <li>• reducing in-crop weed populations by implementing management practices that stimulate germination of weeds prior to planting crop</li> <li>• herbicide and cultural practices that effectively control emerged weeds before planting</li> </ul> <p><b>Herbicide use</b></p> <ul style="list-style-type: none"> <li>• selection of crop production system (e.g. conventional or herbicide-tolerant crop)</li> <li>• herbicide use and cultural program based on crop production system, weed population and herbicide resistance status</li> <li>• herbicide resistance management plan used to choose herbicide</li> <li>• timing and rates of application always as per herbicide label</li> <li>• monitoring of herbicide performance 14 to 21 days following application</li> <li>• contacting an advisor and arranging an inspection if weeds, normally sensitive to the herbicide, survive the application</li> </ul>	<p>Farmer records</p> <p>Crop Management Plan compliance report, where appropriate</p> <p>Herbicide resistance test report</p>	<p>CropLife – integrated weed management principles</p> <p>APVMA approved herbicide label and resistance management plan</p> <p>Technology provider technical manuals</p>

<b>Table 2.5 Control of Crop Volunteers in Agricultural and Non-Agricultural Situations</b> (refer 3.3.2, 3.3.3, 3.3.4)		
<b>Outcome required: Prevent development, reproduction and infestation of crop volunteers, as weeds, in undesirable environments</b>		
<b>Responsibility to act: (a) Farmer (b) In-field service provider, agronomist or consultant</b>		
Process to Manage	Process Documentation	Process Reference
<b>Harvest</b> <ul style="list-style-type: none"> <li>• timing of windrowing and harvest optimised to reduce pod shatter and maximise grain yield and quality</li> </ul> <b>Post-harvest</b> <ul style="list-style-type: none"> <li>• post-harvest machinery clean-down and inspection for cleanliness</li> <li>• monitor for volunteer crop germination and control with herbicide or cultivation</li> </ul> <b>Transport</b> <ul style="list-style-type: none"> <li>• secure, leak-proof transport</li> <li>• monitor for volunteer crop germination and control using appropriate good agricultural practice</li> </ul> <b>Storage</b> <ul style="list-style-type: none"> <li>• secure, leak-proof augers and bins</li> <li>• clean up spillages</li> <li>• monitor for volunteer crop germination and control using good agricultural practice</li> </ul> <b>Herbicide use</b> <ul style="list-style-type: none"> <li>• herbicide use and cultural program (e.g. cultivation, mowing, grading) based on weed population</li> <li>• herbicides applied in herbicide-tolerant crops</li> <li>• an alternative herbicide or appropriate tank mixture partner that is registered for controlling weeds or crop cultivars selected</li> <li>• timing and rates of application always according to the label</li> <li>• herbicide performance monitored 14 to 21 days following application</li> <li>• an advisor contacted and an inspection arranged if weeds, normally sensitive to the herbicide, survive the application</li> </ul>	Farmer records	APVMA approved herbicide labels Technology provider technical manuals

<b>Table 2.6 Input and Service Providers</b> (refer 3.3.1, 3.3.2, 3.3.3, 3.3.4)		
<b>Outcome required:</b> Minimise the risk of contaminating inputs and of contamination by inputs of delivered grain		
<b>Responsibility to act:</b> (a) Farmer (b) In-field service provider, agronomist or consultant		
Process to Manage	Process Documentation	Process Reference
<b>Planting seed</b> <ul style="list-style-type: none"> <li>seed origin</li> <li>seed quality</li> <li>crop cultivar/variety description</li> <li>identity of sowing seed (lot number)</li> <li>seed treatments, as required</li> </ul> <b>Product transport, handling and storage</b> <ul style="list-style-type: none"> <li>seed identification</li> <li>warehouse conditions</li> <li>sanitation</li> <li>inventory control</li> <li>machinery hygiene</li> </ul> <b>Service providers</b> <ul style="list-style-type: none"> <li>agronomists</li> <li>fertiliser contractors</li> <li>spray contractors</li> <li>harvest contractors</li> <li>transport contractors</li> </ul>	Farmer records	ASF Code of Practice for Labelling of Seed QA Systems Product labels: <ul style="list-style-type: none"> <li>directions for use</li> <li>application principles</li> <li>storage, safety and handling</li> </ul>

<b>Table 3.1 Planning pre-Receiveal</b> (refer 3.3.4, 3.4.1, 3.4.2, 3.4.3, 3.6.1)		
<b>Outcome required:</b> Agreement on segregation and receiveal points		
<b>Responsibility to act:</b> Receiveal Agent, grower, technology provider		
Process to Manage	Process Documentation	Process Reference
Planning with growers, technology providers and BHCs & other Receiveal Agents on arrangements regarding production locations (e.g. global positioning system location), receiveal points and segregation		Contractual arrangements

<b>Table 3.2      Receival from Grower</b> <i>(refer 3.2.3, 3.4.1, 3.4.2, 3.7.2, 3.7.3)</i>		
<b>Outcome required: Known status of grain (origin and variety)</b>		
<b>Responsibility to act: Receival Agent and grower</b>		
<b>Process to Manage</b>	<b>Process Documentation</b>	<b>Process Reference</b>
<ul style="list-style-type: none"> <li>receival from grower (grower declaration)</li> <li>sample collection, assessment documentation and procedures</li> <li>sampling and testing of received and/or stored grain</li> <li>misidentification</li> <li>staff training</li> </ul>	Delivery advice Sample documentation	NACMA Trading Standards Customer requirements Receival Agent storage and handling agreement Receival Agent operating procedures

<b>Table 3.3      Storage and Transport</b> <i>(refer 3.4.1, 3.4.2, 3.4.3, 3.5.1, 3.5.2, 3.6.2, 3.7.2, 3.7.3)</i>		
<b>Outcome required: Prevent/minimise adventitious presence</b>		
<b>Responsibility to act: Receival Agent</b>		
<b>Process to Manage</b>	<b>Process Documentation</b>	<b>Process Reference</b>
<ul style="list-style-type: none"> <li>grain transfer (includes movement of grain within a facility)/handling/storage               <ul style="list-style-type: none"> <li>– maintain correlation of farm source identity with transfer to storage location</li> <li>– if appropriate, dedicated facilities for non-GM</li> </ul> </li> <li>cleanliness of equipment</li> <li>documentation of cleaning of equipment used before handling of non-GM grain</li> <li>transport – product to be released by authorised personnel</li> <li>sampling and testing on out-turn</li> <li>misidentification</li> <li>waste</li> <li>staff training</li> </ul>	Receival Agent records	Receival Agent operating procedures Storage and handling agreement Customer requirements

<b>Table 3.4 Transport – road, rail, domestic and export</b> (refer 3.2.3, 3.4.3, 3.5.1, 3.5.2, 3.6.1, 3.6.2, 3.7.2, 3.7.3)		
<b>Outcome required:</b> Prevent or minimise cross contamination		
<b>Responsibility to act:</b> (a) Grain owner (e.g. marketer) (b) Receival or Storage Agent (c) Transport provider		
Process to Manage	Process Documentation	Process Reference
<ul style="list-style-type: none"> <li>cleanliness of equipment               <ul style="list-style-type: none"> <li>– documentation to show traceability and freedom from contamination prior to shipment</li> <li>– procedures</li> <li>– dedicated transport for non-GM, if appropriate</li> <li>– third-party documentation of cleaning procedures</li> </ul> </li> <li>non consecutive shipments</li> <li>misidentification</li> </ul>	Receival Agent, Storage Operator and transport provider records	Contractual arrangements between the grain owner, Receival Agent, Storage Provider and transport provider Storage Operator operating procedures Transport codes of practice or QA systems Customer requirements

<b>Table 3.5 Non-conformance (in storage &amp; handling)</b> (refer 3.4.1, 3.4.2, 3.4.3, 3.5.1, 3.5.2, 3.6.2, 3.7.2, 3.7.3)		
<b>Outcome required:</b> System for managing non conformance and system for managing waste from GM product in place		
<b>Responsibility to act:</b> (a) Receival or Storage Agent (b) Transport provider		
Process to Manage	Process Documentation	Process Reference
<ul style="list-style-type: none"> <li>corrective action identification and response</li> <li>procedures for dealing with non conforming product, e.g. redirection or disposal</li> <li>product verification</li> <li>customer requirements</li> <li>disposal of waste</li> </ul>	Internal records	Receival, Storage and Transport Operator operating procedures Receival, Storage and Transport Operator storage and handling agreement if available

<b>Table 3.6 Grain Processing &amp; Retailing</b> <i>(refer 3.7.1, 3.7.2, 3.7.3, 3.7.4)</i>		
<b>Outcome required: Prevent or minimise adventitious presence of off-types</b>		
<b>Responsibility to act: (a) Processor (b) Manufacturer (c) Packer (d) Retailer</b>		
<b>Process to Manage</b>	<b>Process Documentation</b>	<b>Process Reference</b>
<ul style="list-style-type: none"> <li>• purchase of ingredients</li> <li>• cleanliness of equipment</li> <li>• documentation of flushing and/or cleaning of equipment used before processing non-GM grain or grain product</li> <li>• documentation to show traceability and freedom from adventitious presence before processing non-GM grain or grain product</li> <li>• reconciling processed non-GM seed or grain product with seed or grain product receipt quantities</li> </ul>	Purchase records	Customer requirements
	Storage records	
	Production records	